

AD-A095 781

HENNINGSON DURHAM AND RICHARDSON SANTA BARBARA CA

F/G 16/1

M-X ENVIRONMENTAL TECHNICAL REPORT. ALTERNATIVE POTENTIAL OPERA--ETC(U)

DEC 80

F04704-78-C-0029

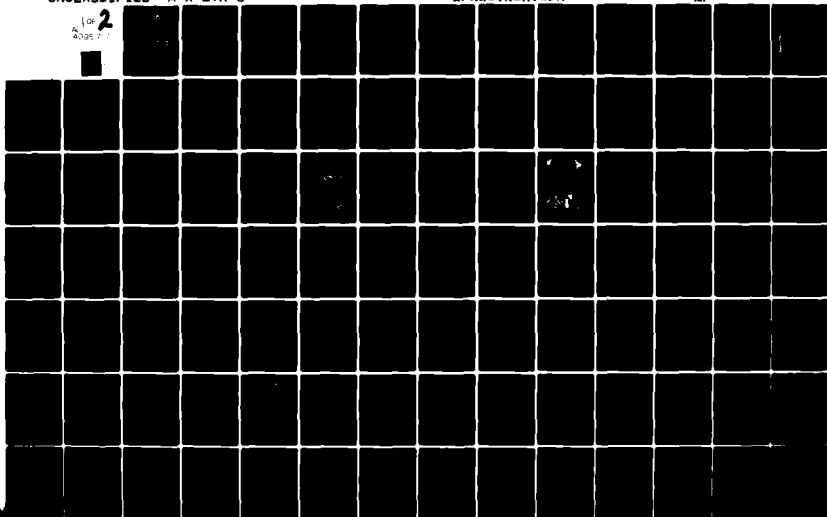
UNCLASSIFIED

M-X-ETR-8

AFSC-TR-A1-23

NI

1 of 2  
2



AD A 095781

**LEVEL III**

13

M-X

**ENVIRONMENTAL  
TECHNICAL REPORT**

**DTIC**  
**ELECTE**  
**S D**  
MAR 03 1981  
**E**

**ETR 8  
OB: CLOVIS**

**FILE COPY**

**DISTRIBUTION STATEMENT A**  
**Approved for public release**  
**Distribution Unlimited**

**81 3 03 124**

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

19 REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER 18) AFSC/IR-81-23	2. GOVT ACCESSION NO. AD-A095784	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) 16) M-X Environmental Technical Report: Alternative Potential Operating Base Locations, Clovis.		5. TYPE OF REPORT & PERIOD COVERED 9) Final Report
7. AUTHOR(s) 14) M-X-ETR-81		6. PERFORMING ORG. REPORT NUMBER MX ETR 8
9. PERFORMING ORGANIZATION NAME AND ADDRESS Henningson, Durham and Richardson Santa Barbara CA 93010		8. CONTRACT OR GRANT NUMBER(s) 15) F04704-78-C-0029
11. CONTROLLING OFFICE NAME AND ADDRESS Ballistic Missile Office Norton AFB CA		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS (12) 48 64312F
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE 22 December 1980
		13. NUMBER OF PAGES 94
		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Unclassified/Unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) MX Clovis, New Mexico Siting Analysis New Mexico Environmental Report		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The area of analysis (AOA) for the Clovis, New Mexico, operating base option is Curry County. The AOA is located in the central section of the designated region of influence (ROI). Clovis and Cannon AFB are the major settlements in the AOA. This section details important environmental characteristics of Clovis and the associated AOA. Effects of construction and operation of an operating base are discussed.		

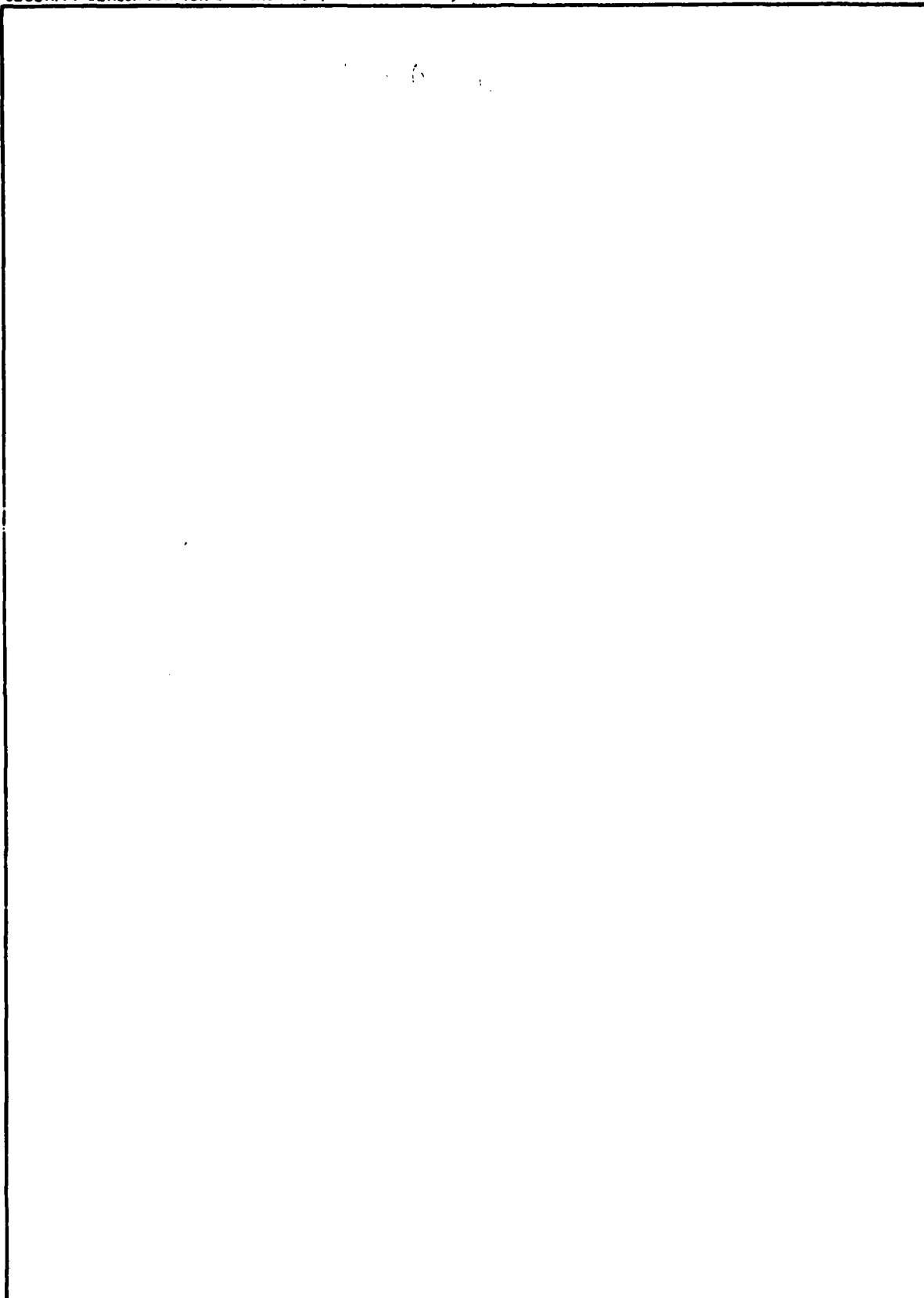
DD FORM 1 JAN 73 1473

EDITION OF 1 NOV 65 IS OBSOLETE

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)



SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

ALTERNATIVE POTENTIAL  
OPERATING BASE LOCATIONS:  
CLOVIS

Prepared for  
United States Air Force  
Ballistic Missile Office  
Norton Air Force Base  
California

Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A	

By  
Henningson, Durham & Richardson  
Santa Barbara, California

22 December 1980

## TABLE OF CONTENTS

	<u>PAGE</u>
1.0 Clovis and Vicinity Community Environment	1
1.1 Human Environment	1
1.1.1 Economic Activity	1
1.1.2 Public Finance	9
1.1.3 Population	9
1.1.4 Land Use	15
1.1.5 Land Ownership	25
1.1.6 Housing	25
1.1.7 Community Infrastructure	25
1.1.8 Quality of Life	32
1.1.9 Energy Supply	32
1.1.10 Traffic and Transportation	32
1.1.11 Native Americans	34
1.1.12 Archaeological and Historic Resources	34
1.2 Natural Environment	36
1.2.1 Biological Resources	36
1.2.2 Surface Water	36
1.2.3 Groundwater	37
1.2.4 Soils and Slopes	38
1.2.5 Air Quality	38
2.0 Environmental Consequences for the Operating Base Vicinity	46
2.1 Human Environment	46
2.1.1 Effects on Employment (Jobs) and Labor Force	46
2.1.2 Effects on Income and Earnings	48
2.1.3 Effects on Public Finance	51
2.1.4 Effects on Population and Communities	55
2.1.5 Effects on Land Use	57
2.1.6 Effects on Land Ownership	65
2.1.7 Effects on Housing	65
2.1.8 Effects on Community Infrastructure	68
2.1.9 Effects on Quality of Life	73
2.1.10 Effects on Energy	78
2.1.11 Effects on Transportation	78
2.1.12 Effects on Native Americans	79
2.1.13 Effects on Archaeological and Historical Resources	79
2.2 Natural Environment	81
2.2.1 Effects on Vegetation	81
2.2.2 Effects on Wildlife	82

	<u>PAGE</u>
2.2.3 Effects on Aquatic Species	82
2.2.4 Effects on Protected Species	82
2.2.5 Effects on Wilderness and Significant Natural Areas	82
2.2.6 Effects on Surface Water	83
2.2.7 Effects on Groundwater Resources	83
2.2.8 Effects on Air Quality	84
2.2.9 Effects on Mining and Geology	84

## LIST OF FIGURES

Figure		Page
1.0-1	Location of Clovis OB in the Texas/New Mexico Region of Influence (ROI).	2
1.1.4-1	Study area zones used in 1977 Cannon AFB environmental study.	22
1.1.4-2	City of Clovis and Cannon AFB, New Mexico.	23
1.1.5-1	Land ownership patterns in the vicinity of Clovis OB.	26
1.1.10-1	Traffic volumes in the vicinity of Clovis.	35
2.1.5-1	Cropland and operating base in the vicinity of Clovis, New Mexico.	63
2.1.9-1	Potential changes in the Quality of Life profiles of Curry County, New Mexico.	77
2.1.11-1	Projected traffic volumes in the vicinity of Clovis, New Mexico, assuming first operating base.	80
2.2.8-1	Potential fugitive dust impacts due to OB construction.	85
2.2.8-2	Predicted one-hour average CO concentrations at the Clovis, New Mexico OB site and community.	86
2.2.8-3	Predicted one-hour average NO <sub>x</sub> concentrations at the Clovis, New Mexico OB site and community.	87



## LIST OF TABLES

Table	Page
1.1.1-1 Total employment and percent share by major economic sectors for selected counties in New Mexico, 1977.	3
1.1.1-2 New Mexico employment growth by major sectors, study area counties, 1967-1977.	4
1.1.1-3 Earnings by major economic sectors, New Mexico counties, 1968-1978.	6
1.1.1-4 Per capita income and earnings shares by major economic sectors, New Mexico counties, 1978.	8
1.1.2-1 General fund receipts and expenditures, City of Clovis, New Mexico, fiscal year 1977-1978.	10
1.1.2-2 Financial statistics for Curry County, New Mexico, fiscal year 1976-1977.	11
1.1.2-3 Assessed volume, indebtedness, and reserve bonding capacity, Curry County, 1979.	12
1.1.3-1 Selected population characteristics in the New Mexico deployment region, by county.	13
1.1.3-2 Population change and components of change, 1960 to 1970 and estimated 1970 to 1976, by county in the Texas region of impact.	16
1.1.3-3 Projected population and annual rates of population change, by county in the Texas/New Mexico impact region, 1978 to 1994.	18
1.1.4-1 Existing land use in Curry County, New Mexico.	19
1.1.4-2 Existing land use in Clovis County, New Mexico.	21
1.1.7-1 Summary of educational statistics for study area locations.	27
1.1.7-2 Health services and facilities in study area locations.	29
1.1.7-3 Police protection characteristics in study area locations.	30
1.1.7-4 Fire protection characteristics in study area locations.	31
1.1.8-1 Quality of life indicators, Curry County.	33
1.2.5-1 Baseline particulate emission levels in New Mexico.	39

Table	Page
1.2.5-2 Baseline SO <sub>2</sub> emission levels in New Mexico.	40
1.2.5-3 Baseline NO <sub>x</sub> emission levels in New Mexico.	41
1.2.5-4 Baseline CO emission levels in New Mexico.	42
1.2.5-5 Baseline HC emission levels in New Mexico.	43
1.2.5-6 Monthly percent frequency of dust observation in Texas/New Mexico region.	45
2.1.1-1 M-X related system employment by place of employment, Alternative 7, Curry County.	47
2.1.1-2 M-X related system employment by place of employment, Alternative 8, Curry County.	47
2.1.1-3 Total civilian M-X related employment, available resident labor force, and net civilian labor force impact, by place of residence, Curry County, Alternative 7.	49
2.1.1-4 Total civilian M-X related employment, available resident labor force, and net civilian labor force impact, by place of residence, Curry County, Alternative 8.	49
2.1.2-1 M-X related earnings, Curry County, Alternative 7.	50
2.1.2-2 M-X related earnings, Curry County, Alternative 8.	50
2.1.3-1 Local government revenues, expenditures and net impacts, Alternative 7 and 8, Curry County.	52
2.1.3-2 School district revenues, expenditures and net impacts, Alternative 7 and 8, Curry County.	53
2.1.3-3 M-X related capital expenditure requirements, Alternative 7 and 8, Curry County.	54
2.1.4-1 Projected baseline population and cumulative M-X related in-migration by alternative, Curry County, assuming trend baseline.	56
2.1.4-2 Projected cumulative population in-migration by project related employment category, by alternative, Curry County, assuming trend baseline.	56
2.1.4-3 Projected cumulative population in-migration by place of residence, by alternative, Curry County, assuming trend baseline.	58

Table		Page
2.1.5-1	Cumulative M-X related land requirements by use category, by alternative, Curry County, assuming trend baseline.	59
2.1.5-2	M-X urban land requirements and impacts, Curry County, by alternative.	60
2.1.5-3	Cropland uses at potential operating base facilities, New Mexico.	64
2.1.6-1	Land ownership at potential operating base facilities at Clovis, New Mexico.	66
2.1.7-1	Cumulative M-X related housing unit requirements in local communities by housing type, by alternative, Curry County, assuming trend baseline.	67
2.1.8-1	Projected baseline and M-X induced school enrollments by grade level, by alternative, Curry County, assuming trend baseline.	69
2.1.8-2	Projected baseline and M-X induced teacher requirements by grade level, by alternative, Curry County, assuming trend baseline.	69
2.1.8-3	Projected baseline and M-X related health services and hospital bed requirements, Curry County, assuming trend baseline.	71
2.1.8-4	Projected baseline and M-X related requirements for law enforcement personnel, by alternative, Curry County, assuming trend baseline.	72
2.1.8-5	Projected baseline and M-X related requirements for fire protection personnel, by alternative, Curry County, assuming trend baseline.	72
2.1.8-6	Projected M-X related land requirements for parks and playgrounds, by alternative, Curry County, assuming trend baseline.	74
2.1.8-7	Projected baseline and M-X related land requirements (acres) for solid waste disposal, by alternative, in Curry County, assuming trend baseline.	75
2.2.8-1	Clovis traffic-related pollutant 1-hour averages, concentrations, in ug/m <sup>3</sup> (ppm) 50 miles from edge of roadway.	88

## **1.0 CLOVIS AND VICINITY COMMUNITY ENVIRONMENT**

The area of analysis (AOA) for the Clovis, New Mexico, operating base option is Curry County. The AOA is located in the central section of the designated region of influence (ROI) as shown in Figure 1.0-1. Clovis and Cannon AFB are the major settlements in the AOA. This section details important environmental characteristics of Clovis and the associated AOA. Effects of construction and operation of an OB are discussed in Section 2.0.

### **1.1 HUMAN ENVIRONMENT**

#### **ECONOMIC ACTIVITY (1.1.1)**

##### **Employment**

Tables 1.1.1-1 and 1.1.1-2 highlight detailed employment characteristics of Curry County. The former table indicates the relative dependence of the county's economy on one sector--government, comprising 38 percent of total employment in 1977. Much of the county's government employment is provided by Cannon Air Force Base near Clovis. Other sectors, notably manufacturing and services, traditionally dominate a well-balanced economic base; in Curry County manufacturing employment is one-quarter that for the national average and services employment is two-thirds that of the United States 1978 share.

Table 1.1.1-2 presents 10-year employment growth figures and indicates that Curry County employment has increased at an average annual rate of 2.2 percent per year. This figure is above the national average but far below the average annual growth in employment for New Mexico as a whole. All sectors have grown appreciably in Curry County except agriculture which experienced an employment loss of 273, and mining where complete employment data are not available.

##### **Income and Earnings**

Total earnings have exhibited little growth over the 1967-1977 period. Table 1.1.1-3 highlights Curry County earnings by major industrial sectors relative to other counties in the state. It indicates that the county's 1977 total earnings of \$208 million was about 3 percent of the state's total. Curry County's rate of earnings growth over the 1967-1977 period was two-thirds that for the United States and only one-third that for New Mexico. Agricultural earnings dropped by over \$10 million. Construction, manufacturing, services and government sectors all posted large earnings gains over the 10-year period.

Table 1.1.1-4 highlights per capita income and earnings shares by major industry in Curry County. The county's 1977 per capita income of \$6,767 was slightly higher than the state figure but only 86 percent of U.S. per capita income. By industrial source, government contributed 38 percent of Curry County's total 1978 earnings, as employment in this sector would have indicated. This was well above the state average of 27 percent and national average of 16 percent. Earnings shares in the other major industries were well below both state and national averages except in agriculture, where earnings levels more than doubled the national average and were two-thirds that for New Mexico.

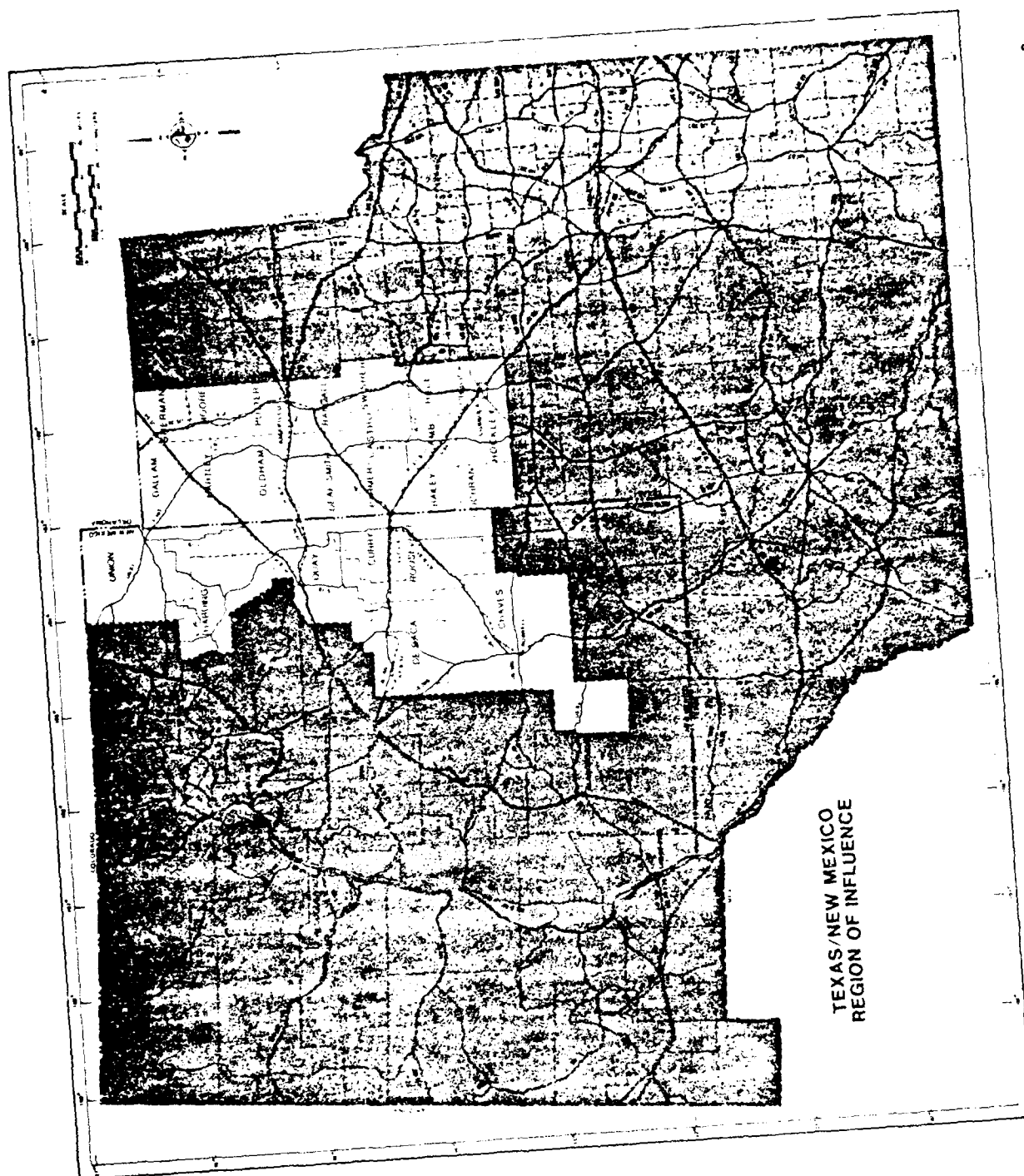


Figure 1.0-1. Location of Clovis OB in the Texas/New Mexico region of influence (ROI).

Table 1.1.1-1. Total employment and percent share by major economic sectors for selected counties in New Mexico, 1977.

COUNTY	TOTAL EMPLOYMENT	PERCENT OF TOTAL STATE EMPLOYMENT	AGRICULTURE SHARE (PERCENT)	MINING SHARE (PERCENT)	CONSTRUCTION SHARE (PERCENT)	MANUFACTURE SHARE (PERCENT)	SERVICES SHARE (PERCENT)	GOVERNMENT SHARE (PERCENT)
Chaves	19,160	3.9	9.3	1.7 <sup>1</sup>	4.2 <sup>1</sup>	11.2	14.5	20.0
Curry	18,558	3.7	6.3	0.1	3.4	5.0	11.2	37.7
De Baca	991	0.2	28.9	0.0	3.9	2.0	(D)	27.3
Harding	664	0.1	47.3	(D)	(D)	8.7	4.5	22.0
Quay	4,900	1.0	18.8	0.2	3.6	3.4	14.9	23.2
Roosevelt	6,566	1.3	22.5	0.2	2.3	3.4	6.4	32.8
Union	2,212	0.4	31.0	(D)	1.9	0.9	11.1	22.9
New Mexico ROI	53,051	10.7	12.5	0.7 <sup>1</sup>	3.5 <sup>1</sup>	6.7	11.8	28.3
Total State	496,514	100.0	4.3	4.7	6.2	6.5	16.8	27.1
United States	97,848,874		4.2	0.8	4.0	20.1	17.4	18.2

<sup>1</sup>Estimated

<sup>2</sup>(D) = not shown to avoid disclosure of confidential information.

Source: BEA, April 1979.

3797-1

Table 1.1.1-2. New Mexico employment growth by major sectors, study area counties, 1967-1977.  
(Page 1 of 2)

COUNTY	TOTAL			AGRICULTURE			MINING			CONSTRUCTION		
	1967	1977	$\Delta^1$	1967	1977	$\Delta$	1967	1977	$\Delta$	1967	1977	$\Delta$
Chaves	15,885	19,160	1.9	2,032	1,774	-1.3	438	334 '76	- 3.0*	610	785 '76	2.8*
Curry	14,935	18,558	2.2	1,442	1,169	-2.1	(D)	16	(D)	425	628	4.0
De Baca	951	991	0.4	361	286	-2.3	(D)	0	(D)	(D)	39	(D)
Harding	702	664	-0.6	372	314	-1.7	0	(D)	(D)	15	(D)	(D)
Quay	4,793	4,900	0.2	1,165	922	-2.3	(D)	(L)'	(D)	146	176	1.9
Roosevelt	5,747	6,566	1.3	1,787	1,477	-1.9	51	12	-13.5	169	148	-1.3
Union	2,093	2,212	0.6	752	685	-0.9	(D)	(D)	(D)	24	43	6.0
Texas ROI	45,106	53,051	1.6	7,911	6,627	-1.8	489	352*	- 3.2*	1,389	1,841	2.9*
Total State	358,436	496,514	3.3	24,907	21,127	-1.6	15,890	23,306	3.9	16,669	30,710	6.3
United States	82,506,400	97,848,874	1.7	4,625,000	4,152,874	-1.1	615,000	824,000	3.0	3,308,000	3,878,000	1.6

3798-1

Table 1.1.1-2. New Mexico employment growth by major sectors, study area counties, 1967-1977 (Page 2 of 2).

COUNTY	MANUFACTURING			SERVICES			GOVERNMENT		
	1967	1977	Δ	1967	1977	Δ	1967	1977	Δ
Chaves	1,030	2,154	7.7	2,503	2,781	1.1	3,171	3,834	1.9
Curry	572	925	4.9	1,444	2,078	3.7	5,719	6,990	2.0
De Baca	(D)	20	(D)	92	(D)	(D)	190	271	3.6
Harding	(D)	58	(D)	(D)	30	(D)	132	146	1.0
Quay	90	166	6.3	637	729	1.4	1,024	1,136	1.0
Roosevelt	224	221	-0.1	446	422	-0.5	1,261	2,156	5.5
Union	(D)	20	(D)	260	245	-0.6	391	506	2.6
Texas ROI	1,916	3,564	6.4	5,382	6,285	1.6	11,888	15,039	2.4
Total State	18,032	32,188	7.0	62,298	83,337	3.0	101,278	134,754	2.9
United States	14,504,000	19,696,000	0.1	12,675,000	17,030,000	3.0	13,924,400	17,795,000	2.5

3798-1

<sup>1</sup>Δ = Average annual growth rate.

<sup>2</sup>(D) = Not shown to avoid disclosure of confidential information.

<sup>3</sup>L = Less than 10 wage and salary jobs.

<sup>4</sup> = Rate in doubt because of large number of data points withheld by disclosure rules.

<sup>5</sup> = Undefined.

<sup>6</sup> = Estimate.

Source: BEA, April 1979.



Table 1.1.1-3. Earnings by major economic sectors, New Mexico counties, 1968-1978.  
(Page 1 of 2)

COUNTY	TOTAL EARNINGS			AGRICULTURE			MINING		
	1968	1978	Δ <sup>1</sup>	1968	1978	Δ <sup>1</sup>	1968	1978	Δ <sup>1</sup>
Chaves	161,706	208,420	2.6	34,588	25,340	-3.1	6,803	9,803	3.3
Curry	176,884	208,420	1.6	30,538	20,328	-4.0	288	346	2.1 <sup>4</sup>
De Baca	6,626	10,100	4.3	2,244	4,243	6.6	(D)	(D)	(D)
Harding	4,974	4,655	-0.7	2,370	1,050	-7.8	(L) <sup>3</sup>	(D)	(D)
Quay	38,136	46,458	2.0	10,309	10,165	-0.1	175	348	12.1 <sup>4</sup>
Roosevelt	62,820	67,935	0.8	28,491	22,083	-2.5	452	978	8.0
Union	25,279	30,275	1.8	14,421	15,427	0.7	(D)	(D)	(D)
New Mexico ROI	476,425	575,856	1.9	122,961	98,636	-2.2	7,648 <sup>6</sup>	11,129	3.8 <sup>4</sup>
Total State	4,027,776	6,166,041	4.4	266,644	266,644	-1.0	259,376	541,278	7.7
United States	1,039,655,600	1,318,750,000	2.4	33,005,625	33,188,000	0.1	10,528,125	20,552,000	6.9

3817-2

Table 1.1.1-3. Earnings by major economic sectors, New Mexico counties, 1968-1978 (Page 2 of 2).

COUNTY	CONSTRUCTION			MANUFACTURING		
	1968	1978	Δ	1968	1978	Δ
Chaves	8,254	13,650	5.2	11,846	25,124	7.8
Curry	6,504	9,597	4.0	7,905	12,105	4.4
De Baca	366	675	6.3	105	153	5.5 <sup>4</sup>
Harding	260	101	-8.2 <sup>4</sup>	491	976	10.3 <sup>4</sup>
Quay	1,292	4,015	12.0	724	1,390	6.7
Roosevelt	1,742	1,888	0.8	1,916	2,530	2.8
Union	696	2,346	12.9	205	432	9.8 <sup>4</sup>
New Mexico ROI	19,094 <sup>6</sup>	32,272	5.4	23,016 <sup>6</sup>	42,710	6.4
Total State	264,064	517,492	7.0	237,330	430,710	6.1
United States	62,388,750	79,872,000	2.5	303,099,380	345,771,000	1.3

3817-2

COUNTY	SERVICES			GOVERNMENT		
	1968	1978	Δ	1968	1978	Δ
Chaves	21,660	29,443	3.1	26,754	38,703	3.8
Curry	14,044	22,317	4.7	71,128	78,939	1.0
De Baca	699	751	0.7	1,558	1,897	2.0
Harding	117	132	1.3 <sup>4</sup>	1,144	1,475	2.6
Quay	4,142	4,599	1.1	9,032	10,316	1.3
Roosevelt	3,769	4,492	1.9	13,886	21,474	4.5
Union	1,862	1,905	0.2	3,919	4,446	1.3
New Mexico ROI	46,290 <sup>6</sup>	63,639	3.2	127,421	157,250	2.1
Total State	687,840	1,012,124	3.9	1,242,111	1,652,096	2.9
United States	153,226,880	221,951,000	3.8	174,725,630	216,896,000	2.2

3817-2

<sup>1</sup>Δ = Average annual growth rate.

<sup>2</sup>(D) = Not shown to avoid disclosure of confidential information.

<sup>3</sup>(L) = Less than 10 wage and salary jobs.

<sup>4</sup>Rate in doubt because of large number of data points withheld by disclosure rules.

<sup>5</sup>— = Undefined.

<sup>6</sup>Estimate.

Source: BEA, July 1980.

Table 1.1.1-4. Per capita income and earnings shares by major economic sectors, New Mexico counties, 1978.

COUNTY	1978 PER CAPITA INCOME	TOTAL 1978 EARNINGS (000's of \$)	PERCENT OF TOTAL STATE EARNINGS	AGRICULTURE SHARE (PERCENT)	MINING SHARE (PERCENT)	CONSTRUCTION SHARE (PERCENT)	MANUFACTURE SHARE (PERCENT)	SERVICES SHARE (PERCENT)	GOVERNMENT SHARE (PERCENT)
Chaves	6,238	208,420	3.4	12.2	4.5	6.5	12.1	14.1	18.6
Curry	6,767	208,013	3.4	9.8	0.2	4.6	5.8	10.7	37.9
De Baca	5,708	10,100	0.2	42.0	(D)	6.7	1.5	7.4	18.8
Harding	5,529	4,655	0.1	22.6	(D)	2.2	21.0	28.4	31.7
Quay	6,224	46,458	0.8	21.9	0.7	8.6	3.0	9.9	22.2
Roosevelt	6,107	67,935	1.1	32.5	1.4	2.8	3.7	6.6	31.6
Union	8,010	30,275	0.5	51.0	(D)	7.7	1.4	6.3	14.7
Texas ROI	6,443	575,856	9.3	17.1	1.9	5.6	7.4	11.1	27.3
Total State	6,599	6,166,041	100.0	6.8	8.8	8.4	7.0	16.4	26.8
United States	7,840	1,318,750,000		4.4	1.6	6.1	26.2	16.8	16

<sup>1</sup>Estimated.

<sup>2</sup>(D) = not shown to avoid disclosure of confidential information.

Source: BEA, July 1980.

3801-1

## **PUBLIC FINANCE (1.1.2)**

Potentially affected local governments in the Clovis operating base location are the city of Clovis and Curry County. Table 1.1.2-1 presents the general fund receipts and expenditures for Clovis.

Total intergovernmental revenues account for 72.68 percent of total general fund revenues. The large majority of these monies come from state shared revenues, with gross receipts tax (sales tax) comprising over 87 percent of this account. Conversely, property tax receipts and other locally raised revenues total only 27.3 percent of the state and federal sources of revenue.

Expenditure patterns reveal that over 97 percent of total general fund disbursements accrue to current operations. In Clovis, only 3.7 percent is expended on capital outlays. This is well below the average of 12.5 percent for municipal governments (1977 Census of Government, U.S. Department of Commerce).

Table 1.1.2-2 presents general revenue and expenditures for Curry County. Revenues are evenly distributed between intergovernmental transfers and tax receipts, with a breakdown of 49.2 percent and 44.1 percent respectively. Expenditure patterns reveal that transportation (highway and street) disbursements comprise over 36 percent of total general expenditures. Transportation expenditures for all county governments average 9.47 percent, four times less than Curry County (1977 Census of Government, County Finances U.S. Department of Commerce).

Table 1.1.2-3 presents assessed value, indebtedness level and reserve bonding capacity for Curry County, Clovis Independent School District and the City of Clovis. Indebtedness levels are limited to 4 percent of assessed valuation of the respective taxing entity. The jurisdictions within Curry County have low to moderate reserve bonding capacities.

In summary, the governmental units in the Clovis and vicinity area have sufficient resources to adequately provide for low to moderate growth. To the extent that the magnitude of the budget and the reserve bonding capacities are relatively low, these jurisdictions are limited in dealing with large-scale rapid growth.

## **POPULATION AND COMMUNITY (1.1.3)**

Curry County, New Mexico is the primary area of analysis for the operating base proposed near Clovis in Alternative 7 and 8, with adjacent Roosevelt County also included due to the probability of spillover of effects into the vicinity of Portales. Curry County's population, estimated as 45,950 in 1978, has increased by about 6,400 persons since 1970. The population of the county, which has a density of about 30 persons per square mile, is concentrated in the municipality of Clovis, with about three-fourths of the county's population, with smaller concentrations in the communities of Melrose and Texico. Roosevelt County's population, estimated as 16,617 in 1977, has also been virtually stationary, increasing by 2.6 percent since 1970.

Data for 1970 on the spatial distribution and age composition of the populations of Curry and Roosevelt counties, shown in Table 1.1.3-1, indicate that a

Table 1.1.2-1. General fund receipts and expenditures, City of Clovis, New Mexico, fiscal year 1977-1978.

	DOLLAR AMOUNT	PERCENT
<b>Revenues</b>		
<b>Taxes</b>	313,984	9.33
Property Tax	140,500	
Occupational Tax	173,484	
Licenses and Permits	67,655	2.01
Fines and Forfeitures	76,595	2.28
Franchise Fees	246,923	7.34
Intergovernmental Revenues	2,446,509	72.68
Current Service Charge	127,017	3.77
Other	87,304	2.59
<b>Total Revenues</b>	<b>3,365,987</b>	<b>100.00</b>
<b>Expenditures</b>		
Personal Services	2,113,700	69.57
Operating Expenses	842,819	27.74
Capital Outlay	81,533	2.69
<b>Total Expenditures</b>	<b>3,038,052</b>	<b>100.00</b>

3415

Table 1.1.2-2. Financial statistics for Curry County,  
New Mexico, fiscal year 1976-1977.

	DOLLAR AMOUNT	PERCENT
General Revenue	1,487,000	100.00
Intergovernmental Revenue	731,000	49.16
Taxes	656,000	44.12
Property Tax	648,000	
Other	8,000	
Charges and Miscellaneous	100,000	6.72
General Expenditure	1,376,000	100.00
Educational	23,000	1.67
Social Services	75,000	5.45
Transportation	501,000	36.41
Public Safety	196,000	14.24
Environment and Housing	54,000	3.92
Governmental Administration	353,000	25.65
Other	174,000	12.65
Exhibit: Salary and Wages	482,000	35.03

3416

Source: U.S. Department of Commerce, Census of Governments,  
1976-1977.

Table 1.1.2-3. Assessed volume, indebtedness, and reserve bonding capacity, Curry County, 1979.

JURISDICTION	ASSESSED VALUE	GENERAL OBLIGATION INDEBTEDNESS	RESERVE BONDING CAPACITY
Curry County	\$106,327,000	\$ 190,000	\$4,063,080
Clovis Municipal School	\$ 90,413,793	\$3,354,000	\$ 271,551
City of Clovis	\$ 72,879,899	\$ 290,000	\$2,625,196

3136

Source: New Mexico Department of Finance and Administration, 1979-80.

Table 1.1.3-1. Selected population characteristics in New Mexico deployment region, by county.  
(Page 1 of 2).

COUNTY	POPULATION 1960-1977				POPULATION DENSITY (PERSONS/MI <sup>2</sup> ) 1975
	1960	1970	1975	1977	
Chaves	57,649	43,335	47,695	49,377	8
Curry	32,691	39,517	43,007	41,093	31
DeBaca	2,991	2,547	2,604	2,558	1
Harding	1,874	1,348	1,230	1,195	1
Quay	12,279	10,903	11,221	11,110	4
Roosevelt	16,198	16,479	16,446	16,617	7
Union	6,068	4,925	4,946	4,937	1
State	951,023	1,017,055	1,143,827	1,196,090	9

4032



Table 1.1.3-1. Selected population characteristics in the  
New Mexico deployment region, by county.  
(Page 2 of 2)

COUNTY	RURAL-URBAN DISTRIBUTION			AGE DISTRIBUTION (1970)				MEDIAN AGE IN YEARS (1970)
	PERCENT RURAL FARM	PERCENT RURAL NONFARM	PERCENT URBAN	PERCENT UNDER 5	PERCENT 5-17	PERCENT 18-64	PERCENT 65+	
Chaves	7.0	14.7	78.3	8.9	30.1	51.9	9.1	25.8
Curry	4.3	9.4	86.4	9.7	28.2	54.8	7.3	23.4
DeBaca	16.4	83.6	0	6.0	26.4	49.5	18.1	38.0
Harding	25.3	74.7	0	5.1	31.3	49.0	13.7	36.1
Quay	13.7	18.0	68.0	8.1	27.5	52.0	12.5	29.6
Roosevelt	19.8	16.1	64.0	7.6	23.3	59.2	9.9	23.4
Union	21.7	13.3	63.7	7.5	28.1	49.1	15.4	33.6
State	5.1	24.9	70.0	9.5	30.5	53.1	7.0	23.8

4032

Sources: U.S. Department of Commerce, Bureau of the Census, City and County Data Book: 1977; 1977 Population Estimates for Counties and Incorporated Places in New Mexico (Series P-25, No. 844), November, 1979; 1970 Census of Population.

majority of the population in both counties, 86 percent in Curry and 64 percent in Roosevelt, was classified as rural-farm. Both counties had populations whose age structure was slightly older than that in the state of New Mexico as a whole. Persons of school age constituted 28.2 percent and 23.3 percent of the total population in Curry and Roosevelt counties, respectively.

Components of population change including net migration and natural increase, or excess of births over deaths, are presented in Table 1.1.3-2 for the periods 1960 to 1970 and 1970 to 1976. Curry and Roosevelt counties experienced net out-migration during both periods although these losses were offset by natural increases. According to Bureau of the Census data, Curry County experienced net out-migration between 1970 and 1976 equal to 3.2 percent of its population in 1970, while the rate was 5.7 percent in Roosevelt County. This pattern contrasts with that for the state of New Mexico as a whole which experienced net in-migration equal to 6.6 percent of its 1970 population.

Projection of future population in Curry and Roosevelt counties, as shown in Table 1.1.3-3, indicate a continued pattern of very modest growth with almost stationary populations. Curry County's population is projected to reach about 44,100 by 1994, a growth rate which is less than 0.5 percent annually. The situation in Roosevelt County is similar, with the population growing at about 0.3 percent annually to reach a population of about 17,500 by 1994.

#### **LAND USE (1.1.4)**

##### **Community Land Use**

Clovis is located within the boundaries of Curry County in the Southern High Plains, New Mexico. Clovis and the surrounding jurisdictions are members of the Eastern Plains Council of Governments which is the regional planning agency and the A-95 clearinghouse responsible for planning in the region. The local planning activities are implemented under the authority of "State Planning Act" (1959), "Planning and Platting" (1965), and "Municipal Airport Law" (1965). The City Commissioners and County Commissioners have the responsibility for planning and zoning decisions in Clovis and Curry County, respectively.

The plans that address future community growth consist of: (1) The General Plan For Clovis, New Mexico, prepared by Gruen Associates, and approved and adopted by the City Commissioners in February, 1969; and (2) A Regional Land Use Policy Plan, adopted by the Regional Council. The general plan, which includes the land use, circulation (transportation), and community facilities elements is presently being updated. A current issue is the proposed expansion of Melrose bombing range, and the USAF is in the process of preparing an assessment for this proposed expansion.

##### **Existing Land Use**

At the present time, recent data on urban land uses for the communities in Curry County is available only for the total amounts of vacant and developed land in each community (see Table 1.1.4-1). Data that is disaggregated by land use category is not available for all of the individual communities. The most recent data by land use categories available for Clovis is from the 1969 general plan and is

Table 1.1.3-2. Population change and components of change, 1960 to 1970, and estimated 1970 to 1976, by county in the Texas region of impact. (Page 1 of 2)

COUNTY	ESTIMATED POPULATION 1977 <sup>1</sup>	POPULATION CHANGE 1970-1977 <sup>1</sup>					
		COMPONENTS OF CHANGE				TOTAL CHANGE	
		NATURAL INCREASE		NET MIGRATION			
		NO.	PERCENT	NO.	PERCENT	NO.	PERCENT
Bailey	7,900	700	9.0	-1,300	-15.9	-600	-6.9
Castro	10,600	1,200	11.1	-1,000	-9.4	200	1.7
Cochran	4,800	300	6.6	-800	-15.6	-500	-9.0
Dallam	6,700	400	7.2	300	4.4	700	11.6
Deaf Smith	20,200	2,600	13.5	-1,400	-7.2	1,200	6.3
Hale	35,300	3,000	8.8	-1,900	-5.5	1,100	3.2
Hartley	3,400	100	4.8	500	16.4	600	21.2
Hockley	21,100	1,600	8.1	-900	-4.6	700	3.5
Lamb	17,400	800	8.1	-1,100	-6.2	-300	-1.9
Lubbock	200,200	17,700	9.8	3,200	1.8	20,900	11.6
Moore	14,900	1,300	9.1	-400	-3.0	900	6.1
Oldham	2,600	200	7.4	200	9.3	400	16.7
Parmer	10,200	1,000	10.1	-1,300	-12.6	-300	-2.5
Potter	92,800	6,100	6.8	-3,800	-4.2	2,300	2.6
Randall	64,500	3,900	7.3	6,700	12.4	10,600	19.7
Sherman	3,800	300	5.9	-100	-1.7	200	4.2
Swisher	10,100	800	7.2	-1,000	-9.5	-200	-2.3
State	12,806,000	868,000	7.8	739,000	6.6	1,602,000	14.4

<sup>1</sup>Estimates to the nearest hundred, Bureau of the Census, Estimates of the Population of Texas Counties and Metropolitan Areas: July 1, 1977 (revised) and 1978 (Provisional), series P-25, No. 867 November 1979.

4033

Table 1.1.3-2. Population change and components of change, 1960 to 1970, and estimated 1970 to 1976, by county in the Texas region of impact.  
(Page 2 of 2)

COUNTY	ESTIMATED POPULATION 1977 <sup>1</sup>	POPULATION CHANGE 1970-1977 <sup>1</sup>					
		COMPONENTS OF CHANGE				TOTAL CHANGE	
		NATURAL INCREASE		NET MIGRATION			
		NO.	PERCENT	NO.	PERCENT	NO.	PERCENT
Bailey	7,900	700	9.0	-1,300	-15.9	-600	-6.9
Castro	10,600	1,200	11.1	-1,000	-9.4	200	1.7
Cochran	4,800	300	6.6	-800	-15.6	-500	-9.0
Dallam	6,700	400	7.2	300	4.4	700	11.6
Deaf Smith	20,200	2,600	13.5	-1,400	-7.2	1,200	6.3
Hale	35,300	3,000	8.8	-1,900	-5.5	1,100	3.3
Hartley	3,400	100	4.8	500	16.4	600	21.2
Hockley	21,100	1,600	8.1	-900	-4.6	700	3.5
Lamb	17,400	800	8.1	-1,100	-6.2	-300	-1.9
Lubbock	200,200	17,700	9.8	3,200	1.8	20,900	11.6
Moore	14,900	1,300	9.1	-400	-3.0	900	6.1
Oldham	2,600	200	7.4	200	9.3	400	16.7
Parmer	10,200	1,000	10.1	-1,300	-12.6	-300	-2.5
Potter	92,800	6,100	6.8	-3,800	-4.2	2,300	2.6
Randall	64,500	3,900	7.3	6,700	12.4	10,600	19.7
Sherman	3,800	300	5.9	-100	-1.7	200	4.2
Swisher	10,100	800	7.2	-1,000	-9.5	-200	-2.3
State	12,806,000	868,000	7.8	739,000	6.6	1,602,000	14.4

4033

<sup>1</sup> Estimates to the nearest hundred, Bureau of the Census, Estimates of the Population of Texas Counties and Metropolitan Areas: July 1, 1977 (revised) and 1978 (Provisional), series P-25, No. 867 November 1979.

Table 1.1.3-3. Projected population and annual rates of population change, by county, in the Texas/New Mexico impact region, 1978 to 1994.

STATE/COUNTY	ESTIMATED POPULATION 1979	PROJECTED POPULATION				PROJECTED ANNUAL RATE OF POPULATION CHANGE			
		1980	1985	1990	1994	1978- 1980	1980- 1985	1985- 1990	1990 1994
Texas									
Bailey	7,700	8,300	8,400	8,490	8,500	3.82	0.24	0.21	0.03
Castro	10,600	10,500	10,700	11,090	11,490	-0.47	0.38	0.72	0.86
Cochran	4,700	5,200	5,200	5,200	5,350	5.18	0.00	0.00	0.71
Dallam	6,700	6,700	7,100	7,500	7,970	0.00	1.17	1.10	1.53
Deaf Smith	20,100	19,700	20,400	21,500	22,530	-1.00	0.70	1.06	1.18
Hale	35,000	37,300	39,300	41,390	43,540	3.23	1.05	1.04	1.27
Hartley	3,300	3,500	3,890	4,290	4,610	2.99	2.14	1.98	1.81
Hockley	21,500	21,500	22,090	22,600	23,150	0.00	0.54	0.46	0.60
Lamb	17,400	17,400	17,400	17,290	17,300	0.00	0.00	-0.13	0.01
Lubbock	200,000	214,100	229,790	243,190	254,410	3.46	1.42	1.14	1.13
Moore	15,000	14,500	14,800	15,190	15,590	-1.68	0.41	0.52	0.65
Oldham	2,600	2,700	2,790	3,000	3,230	1.90	0.66	1.46	1.86
Parmer	10,100	10,300	10,300	10,400	10,710	0.99	0.00	0.19	0.74
Potter/Randall	158,100	162,600	172,780	183,100	192,060	1.41	1.22	1.17	1.20
Sherman	3,700	3,800	3,890	4,000	4,150	1.34	0.47	0.56	0.92
Swisher	10,100	10,500	10,700	11,090	11,570	1.96	0.38	0.72	1.06
17-County Total	526,600	548,600	579,530	609,320	636,160	2.07	1.10	1.01	1.08
State Total	13,014,000	13,393,100	14,452,700	15,593,700	16,615,228	1.45	1.53	1.53	1.60
New Mexico									
Chaves	49,377	51,800	56,100	60,190	63,220	1.61	1.61	1.42	1.24
Curry	41,093	43,600	44,290	44,400	44,070	1.99	0.31	0.05	-0.19
De Baca	2,558	2,600	2,600	2,500	2,500	0.54	0.00	-0.78	0.00
Harding	1,195	1,100	1,000	890	730	-2.72	-1.89	-2.30	-4.83
Quay	11,110	11,200	11,290	11,200	11,030	0.27	0.16	-0.16	-0.38
Roosevelt	16,617	16,500	16,800	17,200	17,510	-0.24	0.36	0.47	0.45
Union	4,937	4,900	4,860	4,900	4,900	-0.25	-0.41	0.41	0.00
7-County Total	126,887	131,700	136,880	141,280	143,960	1.25	0.77	0.63	0.47
State Total	1,196,090	1,266,600	1,403,100	1,539,000	1,638,843	1.93	2.07	1.87	1.58
24-County Region	—	680,300	716,410	750,600	780,120	—	1.04	0.94	0.97

Sources: Texas Department of Water Resources, 1978; Bureau of Business and Economic Research, Univ. of New Mexico, 1979.

4036

Table 1.1.4-1. Existing land use in Curry County, New Mexico.

COMMUNITY	VACANT	DEVELOPED	TOTAL
Clovis	1,460	6,860	8,320
Melrose	695	425	1,120
Grady	80	100	180
Texico	240	290	530
Canon AFB	0	870	870
Total	2,475	8,545	11,020

4107

Source: Personal contact with EPCOG;  
30 October 1980.

shown in Table 1.1.4-2. While an update of this information has not been available, building permit issuances shows that development has been substantial since that time.

A large area of land lying outside the present city of Clovis and adjacent to Cannon Air Force Base was analyzed in an Air Force environmental study in 1977. For ease in identification, the study area was divided into four planning zones (Figure 1.1.4-1). The land use of each zone as described in Cannon AFB, TAB-A1, is presented below:

**Zone 1:** This zone is comprised of approximately 7,640 acres. Predominant use of this area is agricultural, with some commercial activity along the major highway and some residential. Although 80 percent of this area is utilized for farming, more commercial and residential uses are extending out from the Clovis area along U.S. Highway 60-84. With a 10 percent factor in residential occupancy of the land area, this is projected to increase about 10 percent in the next five years. The succeeding five year growth in this zone will be influenced by the trend of more families moving to acreages outside the city limits. Unless zoned for other than residential, the expansion of this type activity will be accelerated tremendously.

**Zone 2:** The make-up of this zone is the same as Zone 1. It is predominantly a farming area with scattered residential and commercial activities. It consists of 13,340 acres. Several acreages have been plotted on State Road 468 for residential purposes. This area will contain some commercial activities along the highway and railroad frontage. The commercial activities now consist of a grain elevator, two fertilizing companies, a butane gas company, a private campground and others.

**Zone 3:** This section consists of 14,040 acres and is comprised of 98 percent farming and ranching and 2 percent residential land use assignments. The most acceptable area for residential development is along State Road 468.

**Zone 4:** This zone is comprised of 7,360 acres of which 95 percent is farming and ranching, 4 percent is residential, and 1 percent is commercial. This area will have possible expansion in residential use within the next five years due to the trend of more families moving to acreages outside the city limits. Also quite a number of military families prefer small acreages in order to keep livestock such as horses and prefer to live in an area with easy access to the base.

As indicated in the report, there is some land available within the above categories for development or in some cases, redevelopment. Most new development, however, will come by way of expansion of the present city area.

#### **Land Use Plans and Zoning**

In June 1967 the city of Clovis, New Mexico began the development of a general plan for development of the city. The portion of the valley proposed for development by 1990 was included in the planning study.

The planning area analyzed in the Clovis General Plan (Figure 1.1.4-2) encompassed an area of over 64,000 acres and included the city of Clovis, Cannon

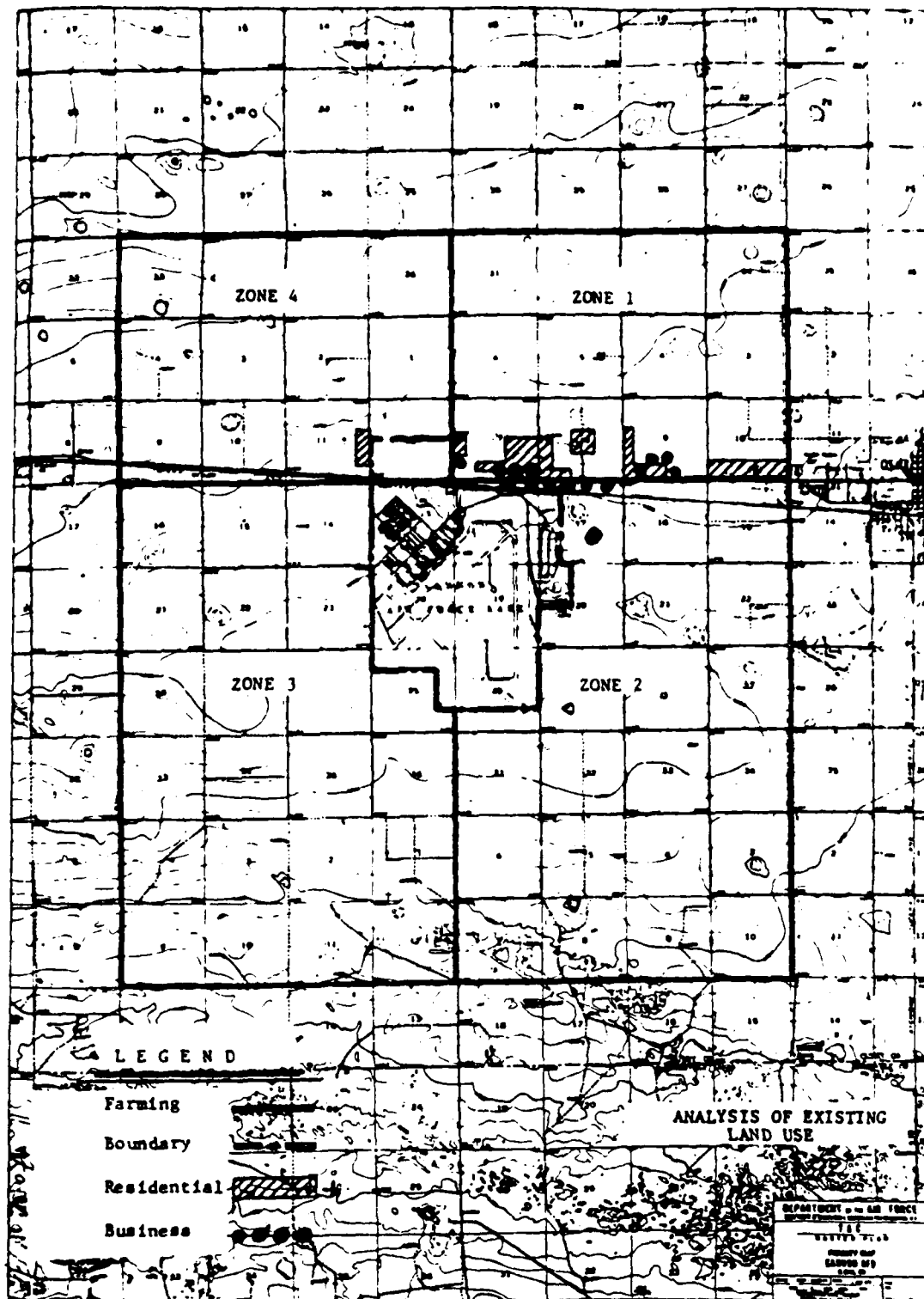
Table 1.1.4-2. Existing land use in  
Clovis County, New  
Mexico.

LAND USE CATEGORY	ACRES	PERCENT
Residential	4,919	67.8
Commercial	286	3.9
Industrial	760	10.5
Schools	265	3.7
Parks and Recreation	775	10.7
Miscellaneous	250	3.4
Total	7,255	100.0

2593-1

Source: City of Clovis, 1969, "Clovis  
General Plan".





2091-A

Figure 1.1.4-1. Study area zones used in 1977 Cannon AFB environmental study.

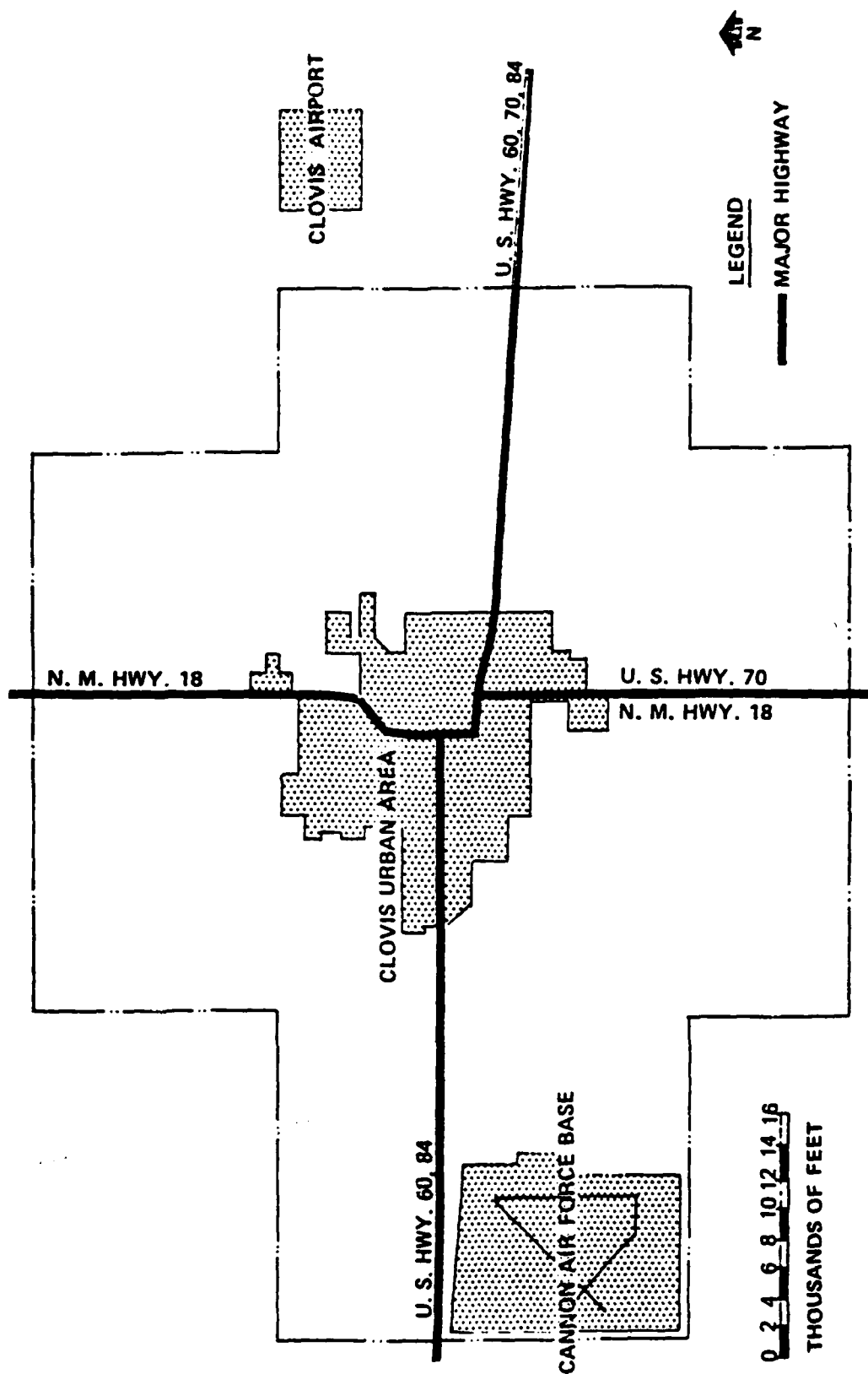


Figure 1.1.4-2. City of Clovis and Cannon AFB, New Mexico.

Air Force Base and adjacent lands. The federal government owned .059 percent of the land area. The remainder of the area was devoted to residential, commercial, industrial and farming and ranching uses.

The trends in the Clovis area have seen an improvement of existing industrial and residential areas combined with expansion of the residential and commercial areas. The southern portion of Clovis is largely manufacturing and industrial, while the northern portion of Clovis is primarily residential and commercial.

Some policy statements in the general plan would impact the development of the M-X facility near Clovis inasmuch as most offbase development would concentrate in and around Clovis. These policies are as follows:

- o Orderly growth should be encouraged as opposed to wasteful urban sprawl.
- o Vacant or unindustrialized land within the city should be developed first.
- o Development should help improve the attractiveness of the physical environment.

Other proposals of the land use plan deal with the development of various residential neighborhoods, commercial development, circulation, community facilities and a central business district plan.

A zoning ordinance was adopted by Clovis in 1948. It has not been regularly revised and updated to keep pace with changes in types and quality of development. As a result, it has become commonplace to grant many variances to the ordinance which has diminished its effectiveness. The City of Clovis has the authority to regulate development within a 5 mi radius of the Clovis City limits as part of its extra-territorial zoning powers.

### **Rural Land Use**

Total land area in Curry County is approximately 898,560 acres and is predominately (96 percent) in agricultural uses. Croplands constitute the larger portion (65 percent), with the remainder as grazing lands (31 percent). Curry County ranked highest in the production of corn, wheat, and sorghum grain among the counties in New Mexico in 1976, and it ranked third in the "all cattle" category.

### **Agriculture**

The proposed OB facilities at Clovis are located in a region used predominately for irrigated agriculture. There has been a decline in irrigated farming and a corresponding increase in dryland farming. This change has resulted in a reduced economic output for agriculture industry.

### **Recreation**

No recreation areas are located proximate to the proposed OB facilities.

## Mining

No mining operations are located near the proposed OB complex.

## **LAND OWNERSHIP (1.1.5)**

Within a 5-mi radius of the proposed operating base, as shown in Figure 1.1.5-1, 95 percent of the land is privately owned, the other 5 percent being comprised of four separate sections of state land.

About 96 percent of the land area in Curry County is privately owned and comprises about 834,031 acres. A large portion of the remainder is owned by the state of New Mexico. Federal lands in the county are the Cannon AFB installation, about 3,500 acres, and BLM lands, about 400 acres.

## **HOUSING (1.1.6)**

Curry County has experienced modest growth in housing over the last two decades. From 1960 to 1970, the county had a 2.1 percent average annual growth rate, increasing the number of housing units from 10,098 to 12,390 (U.S. Census of Housing, 1970). In the next decade the average annual growth rate quickened to 3.1 percent, so that by 1979, there were an estimated 14,916 housing units in Curry County. The proportion of the county's housing stock in single-family units decreased from 81.7 percent in 1970 to 68.7 percent in 1979. Conversely, the share of multi-family units and mobile homes increased to 31.3 percent, from 18.3 percent in 1970.

It is estimated from annual permits authorizing residential construction that over the 1970 to 1979 period an average of 253 conventionally-built housing units were added to the housing stock each year, with a maximum yearly authorization of 322 in 1972 (Bureau of the Census, Construction Reports). In 1979 there were an estimated 2,312 mobile homes in Curry County, representing 15.5 percent of the housing units. In 1970 the owner-occupancy rate was 59.4 percent. In the same year almost 78 percent of the housing was located in one community, Clovis.

## **INFRASTRUCTURE (1.1.7)**

### **Organization**

The city of Clovis, incorporated in 1909, operates under a City Commission City Manager form of government, with one of the commissioners serving as mayor. Curry County is governed by three elected County Commissioners. The county is part of a soil and water conservation district, El Hano Estado Resource Conservation and Development District; and is also one of seven counties belonging to the Eastern Plains Council of Governments, headquartered at Clovis. There are four school districts located in the cities of Clovis, Grady, Texico, and Melrose.

### **Education**

Historical enrollment levels in the Clovis School District show a general decline over the years. Presently the school system supports 7,850 total enrollments with a capacity for 1,900 additional students (Table 1.1.7-1). Fourteen kindergarten teachers and 367 teachers in grades 1-12 work in the district, and are supported by 36 special education teachers. No new development is planned, although 40 acres are available and being considered for a new high school.

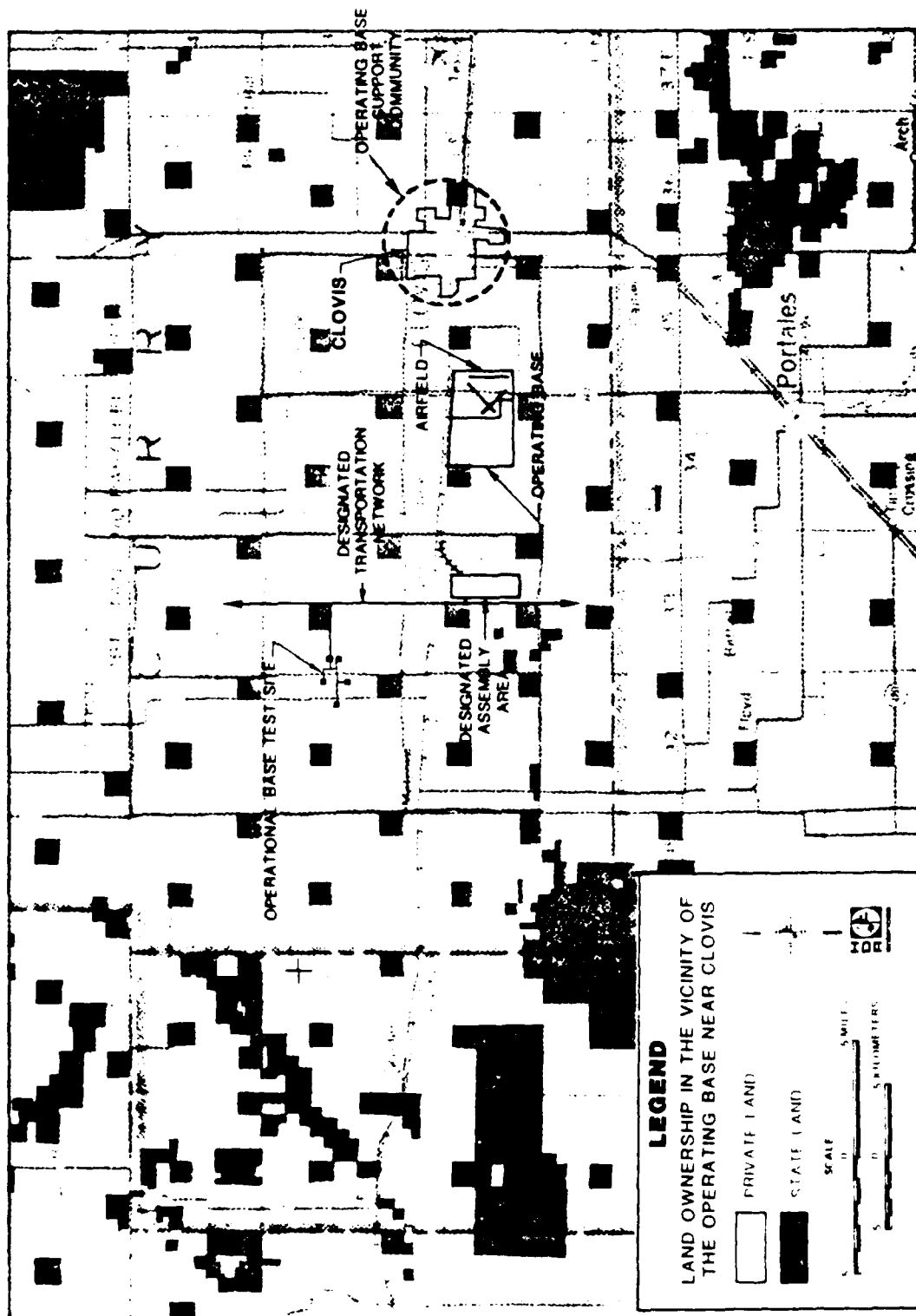


Figure 1.1.5-1. Land ownership patterns in the vicinity of Clovis OB.

Table 1.1.7-1. Summary of educational statistics for study area locations.

COUNTY	ENROLLMENTS	EXCESS CAPACITY	TEACHERS	PUPIL/TEACHER RATIO	FUTURE PLANS
White Pine <sup>1</sup>	1,662	1,060	91	18.3	Not available
Clark <sup>1</sup>	86,479 ( '79)	Very little	3,730	23.1	Development occurring
Iron <sup>2</sup>	4,052	40	191	21.2	School bond passed to build new elementary school
Beaver <sup>3</sup>	1,026	650	53	19.4	Not available
Millard <sup>4</sup>	2,176	134	88	24.7	Remodeling occurring
Dallam <sup>5</sup>	1,600	100	102	15.7	Available land for future expansion
Curry <sup>6</sup>	7,850	1,875	417	18.8	Expansion of classrooms in all levels is planned
Lincoln <sup>7</sup>	911	170	54	16.9	Not available

1347-2

<sup>1</sup>Nevada Department of Education, 1979-80. Enrollment and Certified Personnel Information. Vol. 22. Research Bulletin, Nevada Department of Education.

<sup>2</sup>Iron County School District, 20 May 1980. C. Morris, School Superintendent, Telephone Communication.

<sup>3</sup>Beaver County School District, 20 May 1980. L. Haslam, School Superintendent, Telephone Communication.

<sup>4</sup>Millard County School District, 20 May 1980. Ken Topham, School Superintendent, Telephone Communication.

<sup>5</sup>Dalhart Independent School District, 22 May 1980. D. Williams, School Superintendent, Telephone Communication.

<sup>6</sup>Cannon Air Force Base Environmental Coordinator, 1975. Tab A-1. Environmental Narrative, Clovis, New Mexico.

<sup>7</sup>U.S. Department of the Interior (BLM), Social-Economic Profile, Lincoln County, July 1976.

## **Health Care**

Clovis High Plains Hospital and several health clinics serve the Clovis community (Table 1.1.7-2). The hospital in Clovis has a capacity of 106 acute care beds. Cannon Air Force Base also operates a 100 bed hospital located in Portales. Twenty-two doctors, 110 nurses (RN and LPNs), 18 dentists, and 12 mental health workers serve the community with 4 additional doctors located in Portales. Presently the Clovis High Plains Hospital, which was built in 1978, is utilized at 65 percent.

## **Public Safety**

There are 72 police officers serving the city of Clovis. They are supported by six sheriffs patrolling county land and eight state police officers, as shown in Table 1.1.7-3. Eleven dispatchers support the patrolling officers as well as four administrative officers.

The city of Clovis maintains five engine companies staffed by 75 firemen. One of these companies is located at the airport and operates a crash truck to serve the aircraft and airport area. The firemen in Clovis are all EMP trained and operate seven ambulances throughout the city. Other pieces of equipment include eight 1,500-gallon pumper trucks, one snorkel unit, and one rescue truck as shown in Table 1.1.7-4. Currently the fire department maintains a fire insurance rating of "6" and is planning on moving into a "4" rating soon. Under agreement with the Cannon AFB fire department, both departments share equipment and personnel when an emergency situation occurs.

## **Water Supply and Distribution**

Clovis derives its water supply from 36 wells with a total capacity of nearly 16 mgd. Individual well capacities range from 90 to 1,140 gpm. Chlorination is the only form of treatment provided. Elevated storage capacity is 1.5 mg while ground level storage provides an additional 7.0 mg in capacity. Current winter use ranges from 4.5 to 5.5 mgd with peak daily use in the summer reaching 16.7 mgd. Additional capacity (3,000 gpm) will be available this winter upon the completion of 3 new wells. An additional project with completion in 1983 will increase the number of wells by 5 and mean an additional 5,000 gpm in capacity.

## **Wastewater Collection and Treatment**

Wastewater treatment is provided by facultative lagoons with an aerated lagoon serving as a primary basin. A new lagoon system is under construction which will be completed in October 1981. Facility capacity will be 4.5 mgd upon completion. The effluent is used for farmland irrigation.

## **Solid Waste**

The city of Clovis operates a combined wastewater and solid waste disposal site which is approximately 180 acres, 80 acres of which are utilized for solid waste disposal. At current usage rates, available space will be exhausted in 1982. Future plans include developing a new wastewater treatment area which would also include a new solid waste disposal site.

Table 1.1.7-2. Health services and facilities in study area locations.

COUNTY/ COMMUNITY	HOSPITAL FACILITIES	PHYSICIANS	RN, LVN, LPN	DENTISTS	MENTAL HEALTH WORKERS	COMMENTS
White Pine County/ Ely <sup>1</sup>	43 Acute 99 Skilled Nursing	4	19 RN 10 LPN 46 Aids	3	6	Nursing home under construction, 99-bed capacity
Clark County/ Coyote Springs <sup>2</sup> Area	1,778 Acute 919 Long- Term	508 (78 <sup>1</sup> )	1,412 RN 594 LPN	163	N/A	
Iron County/Beryl and Vicinity <sup>3</sup>	73 Acute	15	35 Nurses	10	2	Community has excess capacity in hospital; Present utilization rate is less than 50 percent.
Beaver County/ Milford and Vicinity <sup>4</sup>	12 Acute 20 Long-Term	1	6 RN 2 LPN	1 Part-time	0	
Millard County/ Delta and Vicinity <sup>5</sup>	18 Acute 18 Long-Term	5	7 RN 6 LPN	4	2	
Dallam and Hartley Counties/Dalhart and Vicinity <sup>6</sup>	67 Acute 80 Long-Term	5	10 RN 20 LVN	4	N/A	Expansion plans are in process to double the number of doctors and hospital beds in area.
Curry County/Clovie and Vicinity <sup>7</sup>	106 Acute 100 beds at Cannon AFB	22	110 Nurses	18	12	Hospital utilized at 65 percent.
Lincoln County/ Panaca Pioche, Caliente and Vicinity <sup>8</sup>	10 Acute 9 Skilled Nursing	2	6 RN	1	N/A	

1348-2

<sup>1</sup>Nevada Bureau of Business and Economic Research, July 1977. Socioeconomic Analysis of the White Pine Power Project. Reno, Nevada.

<sup>2</sup>Clark County Health District, 6 June 1980. A. Dague, Health Planner, Telephone Communication.

<sup>3</sup>Bureau of Economic and Business Research, 1979. Community Economic Facts—Cedar City.

<sup>4</sup>Millard Valley Memorial Hospital, 6 June 1980. J. Williams, Director of Nursing, Telephone Communication.

<sup>5</sup>Architects/Planners Alliance, Inc., 1979. Socioeconomic Analysis—Lyndell Alternative Site, Salt Lake City.

<sup>6</sup>Dalhart Hospital, 6 June 1980. A. Peterson, Director of Nursing, Telephone Communication.

<sup>7</sup>Clovie High Plains Hospital, 6 June 1980. S. Grigsby, Director of Nursing, Telephone Communication.

<sup>8</sup>U.S. Department of Interior (BIM), Social Economic Profile, Lincoln County, July 1976.



Table 1.1.7-3. Police protection characteristics in study area locations.

COUNTY/COMMUNITY	POLICE OFFICERS	SHERIFF	HIGHWAY PATROL
White Pine County <sup>1</sup> Ely and vicinity	14	15	3
Clark County <sup>2</sup> Coyote Springs area	738	Serves Area	Serves Area
Iron County <sup>3</sup> Beryl and vicinity	15	Serves Area	Serves Area
Beaver County <sup>4</sup> Milford and vicinity	2	Serves Area	Serves Area
Millard County <sup>5</sup> Delta and vicinity	3	4	6
Dallam/Hartley Counties <sup>6</sup> Dalhart and Vicinity	7 (Dallam) 0 (Hartley)	14 (Dallam) 2 (Hartley)	4 (Dallam) 0 (Hartley)
Curry County <sup>7</sup> Clovis and Vicinity	72	Serves Area	Serves Area
Lincoln County <sup>8</sup> Panaca, Pioche, Caliente	6	7	1

1349-1

<sup>1</sup>White Pine County Sheriff's Department, 5 June, 1980. M. Burns, Deputy, telephone conversation.

<sup>2</sup>Las Vegas Police Department, 5 June 1980. Officer Bottomly, Personnel Officer, telephone conversation.

<sup>3</sup>Bureau of Economic and Business Research, 1979, Community Economic Facts—Cedar City.

<sup>4</sup>Five County Association of Governments, 1976, *Planning for Growth in Beaver County*, Beaver County Planning and Development Agency.

<sup>5</sup>Architects/Planners Alliance Inc. 1979. Socioeconomic Analysis—Lynndyl Alternative Site, Salt Lake City.

<sup>6</sup>Panhandle Regional Planning Commission, 22 May 1980. M. Kenderdine, Planner, telephone conversation.

<sup>7</sup>Clovis Police Department, 5 June 1980, Y. Garcia, Secretary I, telephone conversation.

<sup>8</sup>U.S. Department of Interior(BLM), Social-Economic Profile, Lincoln County, July 1976.

Table 1.1.7-4. Fire protection characteristics in study area locations.

COUNTY/COMMUNITY	FULLTIME FIRE DEPARTMENT	VOLUNTEER FIRE DEPARTMENT	FIRE INSURANCE RATING	COMMENTS (EQUIPMENT, ETC.)
White Pine County, Ely <sup>1</sup>	5 Paid Staff	45 Volunteers	5	Rescue mini pumper, 250 gallon capacity 1300 gallon/minute pumper, 1000 gallon capacity 1350 gallon/minute 1 GMC tank/pumper combination 650 gallon/minute La France, 240 gallon capacity 350 gallon/minute La France, 240 gallon capacity 750 gallon/minute pumper, 500 gallon capacity 1500 gallon/minute Walter Foam Truck
Clark County, Las Vegas <sup>2</sup>	254 Fire Fighters	-	3 (will move into "2" rating soon)	9 Fire trucks and 2 snorkler trucks.
Iron County, Cedar City <sup>3</sup>	3 paid staff	32 Volunteers	5	4 pumper trucks (1,250 and 750 gallon) 2 brush trucks 1 crash truck at airport 1 snorkle truck Several ambulances
Beaver County, Milford <sup>4</sup>	-	High School Students act as Volunteer Fireman	7	Several pumper trucks
Millard County, Delta <sup>5</sup>	-	25 Volunteer	7	3 pumper trucks (500, 750, and 1,000 gallon)
Fillmore	-	30 Volunteers	7	3 pumper trucks (500, 750, and 250 gallon)
Dallam and Hartley Dalhart <sup>6</sup>	1 paid staff	30 Volunteers	24¢ Key Rating Rating Range from 1¢ (excellent) to \$1.00 (poor)	Two 1,500-gallon pumper trucks One 250-gallon mini-pumper One back-up pumper (old) Five 4-wheel drive vehicles
Curry County Clovis <sup>7</sup>	75 Fireman (EMP trained)	-	6 (will move into a "4" soon)	Eight 1,500-gallon pumpers Two snorkle units One crash truck and several ambulances
Lincoln County <sup>8</sup> Panaca, Pioche, Calliente	-	55-60 Volunteers	7 Pioche, Calliente 8 Panaca	One 250-gallon pumper Four 500-gallon pumpers One 450-gallon pumper Two 125-gallon slip on units

1350-1

- <sup>1</sup>Ely Fire Department, 5 June 1980. F. Ritchie, Dispatcher, telephone conversation.
- <sup>2</sup>Las Vegas Fire Department, 5 June 1980. R. Horrocks, Chief Secretary, telephone conversation.
- <sup>3</sup>Cedar City Fire Department, 6 June 1980. C. Neilson, Fire Marshall, telephone conversation.
- <sup>4</sup>Five County Association of Governments, 1976, Planning for Growth in Beaver County, Beaver County Planning and Development Council.
- <sup>5</sup>Architects/Planners Alliance Inc., 1979. Socioeconomic Analysis-Lyndyl Alternative Site, Salt Lake City.
- <sup>6</sup>Dalhart Fire Department, 10 June 1980. M. Stipe, Fire Chief, telephone conversation.
- <sup>7</sup>Clovis Fire Department, 10 June 1980. J. Carter, Fire Chief, telephone conversation.
- <sup>8</sup>U.S. Department of Interior (BLM), Social-Economic Profile, Lincoln County, July 1976.

## **Parks and Recreation**

The city of Clovis possesses ten parks with playground facilities ranging in size from 3 to 100 acres. One 3,400 acre park is located 6 mi from town. Other facilities within the city include 14 ballfields, an 18-hole golf course, seven tennis courts, four basketball courts, eight soccer fields, and two olympic size swimming pools. According to the park superintendent, there are adequate recreational facilities to serve the present population.

## **QUALITY OF LIFE (1.1.8)**

Curry County's quality of life indicators (Table 1.1.8-1) show it to be a fairly typical eastern New Mexico county, with an economic base that is dominated by irrigated and dryland farming, ranching, light manufacturing, and Cannon Air Force Base. The county has been growing at a moderate rate and is relatively densely populated with an average of 31 persons/mi<sup>2</sup>. However, its economic growth has been slower than its population growth and its per capita income was less than \$3,700 in 1977, 37 percent below the state figure. On two of the other economic well-being indices, Curry County does better than the state, with a low unemployment rate (4.3 percent compared to 7.8 percent for New Mexico) and a lower proportion of the population on public assistance (17.6 percent, versus 20.9 percent for the state). On some of the community service indices, Curry County does not compare as favorably with state averages. For example, the county has a higher student to teacher ratio (22.3 to 1 versus 22.1 to 1), and fewer doctors, nurses, dentists, and police officers per capita.

The county does have a high level of cultural, religious, and ethnic heterogeneity, and its indicators of social organization show it to be a fairly stable community. For example, crime rates are 60 percent below New Mexico's average; alcohol and substance abuse is 40 percent below the state figure; and divorce rates are 15 percent lower.

Most rural land in the vicinity of Clovis is privately held and local farmers tend to be possessive of their private property, and have developed their values and lifestyles around this fact.

## **ENERGY SUPPLY (1.1.9)**

The Clovis base is located in an area served by the Gas Company of New Mexico, a subsidiary of Southern Union Gas Company, Dallas. Gas supplies throughout the area appear to be excellent. Petroleum product and crude oil pipelines traverse the Clovis area. Fuel supplies are excellent and no major problems should be encountered.

Electrical energy is supplied to Clovis by Southwestern Public Service Company (SWPS) via two 115 KV transmission lines. The present 10 MW electrical load at Cannon AFB is supplied by SQPS via a 69 KV transmission line from Clovis.

## **TRAFFIC AND TRANSPORTATION (1.1.10)**

The proposed site involves an expansion of an existing facility, Cannon AFB. It is approximately located 10 miles west of Clovis on U.S. Highway 60, which runs

Table 1.1.8-1. Quality of life indicators, Curry County.

	WHITE PINE CO. (ELY)	CLARK CO. (KANE SPRINGS)	IRON CO. (BERYL)	BEAVER CO. (MILFORD)	HILLARD CO. (DELTA)	CURRY CO. (CLOVIS)	DALLAM CO. (DALHART)	HARTLEY CO. (DALHART)
<b>Population</b>								
Annual Rate of Growth (1970-1977) <sup>4,5,11</sup>	-1.2	4.0	2.9	1.6	2.5	2.0	1.7	1.6
Population Density (1977) <sup>5,9,11</sup>	.9	45.7	4.4	1.7	1.2	31.0	4.4	2.0
<b>Housing</b>								
Percent of Dwelling Units Owner Occupied (1970) <sup>11</sup>	72.8	58.0	70.5	82.5	85.5	59.4	65.6	69.2
Percent of Housing Units with More than 1.01s per Room (1970) <sup>11</sup>	12.6	8.9	9.5	8.1	10.3	10.5	8.6	11.5
Mobile Homes or Trailers as Percent of Housing Units (1970)	12.1	11.0	8.4	4.1	2.8	NA	NA	NA
Median Home Value (1970) <sup>11</sup>	10,497	23,142	16,487	12,081	10,519	13,025	7,358	16,919
<b>Economics</b>								
Civilian Labor Force Growth Rate (1970-1977) <sup>9</sup>	-1.4	6.3	5.8	4.1	3.3	1.1	5.3	13.9
Unemployment Rate (1977) <sup>9</sup>	7.8	8.1	6.2	7.0	4.7	4.3	4.5	2.1
Per Capita Income (1977) <sup>9</sup>	9,368	7,735	4,693	5,114	3,978	3,687	3,866	4,611
Proportion of Population on Public Assistance (1976) <sup>11</sup>	15.6	15.5	13.3	18.1	20.7	17.6	20.4	7.4
<b>Health</b>								
Physicians/1,000 Population (1976)	0.3	1.2	0.7	1.0	0.5	0.7	0.6	0.0
Dentists/1,000 Population (1976)	0.3	0.4	1.0	0.9	0.3	0.5	.3	.3
Registered Nurses/1,000 Population (1976)	3.1	3.2	3.8	5.3	2.5	4.2	5.4	5.4
Hospital Beds/1,000 Population (1976)	4.4	4.7	3.6	5.6	4.5	3.0	6.9	0.0
<b>Public Safety</b>								
Police Officers/1,000 Population (1976) <sup>1</sup>	2.8	3.4	1.8	1.0	1.1	2.0	NA	NA
Fireman/1,000 Population	NA	NA	NA	NA	NA	NA	NA	NA
Violent Crimes/1,000 Population (1976) <sup>1</sup>	4.8	9.6	1.5	1.5	1.5	2.3	1.4	1.4
Crimes Against Property/1,000 Population (1976) <sup>1</sup>	34.5	84.9	21.1	21.1	21.1	15.4	14.8	14.8
<b>Social Disorganization</b>								
Divorce Rates/1,000 Population (1975) <sup>11</sup>	11.2	18.6	3.5	3.7	1.7	6.3	6.9	4.7
Suicide Rate/1,000 Population (1976) <sup>1</sup>	60.0	23.3	3.0	9.4	9.4	18.3	11.9	11.9
Alcoholism Rate/1,000 Population (1976) <sup>1</sup>	38.3	46.0	22.8	22.8	19.3	18.1	19.2	19.2
<b>Education</b>								
Median School Year Completed (1976) <sup>1</sup>	12.1	12.4	12.8	12.3	12.4	12.2	11.3	12.4
Pupil/Teacher Ratio	21.2	25.0	24.8	21.2	23.4	22.3	15.7	15.7

<sup>1</sup>U.S. Dept. of Commerce, Statistical Abstract of the United States, 1978.<sup>2</sup>Nevada Dept. of Education, 1979, Research Bulletin, Vol. 21, No. 1<sup>3</sup>Utah Superintendent of Public Instruction, 1978. Annual Report of the State Superintendent.<sup>4</sup>Nevada Office of Planning Coordination, 1978. Nevada Statistical Abstract.<sup>5</sup>Utah Bureau of Economic and Business Research, Statistical Abstract of Utah, 1979.<sup>6</sup>DeChiasa, J. and L. Koppelman, 1975. Urban Planning and Design Criteria, New York, Litton Educational Publishing, Inc.<sup>7</sup>Architects/Planners Alliance, Inc., 1979. "Socioeconomic Analysis-Lynndyl Alternative Site." Intermountain Power Project.<sup>8</sup>Four Corners Regional Commission, 1979. Six County Development Plan.<sup>9</sup>U.S. Dept. of Commerce, 1979. Bureau of Economic Analysis Computer Printouts.<sup>10</sup>Golden, J. et al., 1979. Environmental Impact Data Book.<sup>11</sup>U.S. Bureau of the Census, 1977. City and County Data Book, 1978.<sup>12</sup>Nevada Office of Health Planning and Resources, 1977. Nevada State Plan for Health.<sup>13</sup>United States Dept. of Justice, 1977. Uniform Crime Rates for the United States--1977. U.S. GPO, 1978.<sup>14</sup>U.S. Bureau of the Census, 1972. County and City Data Book, 1973.

east and west through the area. This is the primary access route and carries the large majority of traffic to the existing base. State Route 467 extends south from near Clovis and provides access to Portales, 13 mi from the base. Figure 1.1.10-1 is a schematic map of the area showing the major roads in the vicinity and 1978 traffic volumes.

U.S. Highway 60 is a four-lane road with average daily traffic of 12,990 in the vicinity of Cannon AFB. Traffic on this road is expected to increase even without the M-X project but the existing road should continue to provide a good level of service.

State Route 467 is a low volume two-lane road currently classified as a secondary road. Traffic on this road is unlikely to increase appreciably without the M-X project since U.S. Highway 70 roughly parallels it to the east and provides a much better route between Portales and Clovis.

#### **NATIVE AMERICANS (1.1.11)**

No significant cultural resources associated with the Apache and Commanche peoples have been documented for the Clovis region of eastern New Mexico. There are no reservation lands or Native American communities on the Clovis OB siting area and none close enough to the siting area to expect land or water resource utilization.

#### **Paleontology**

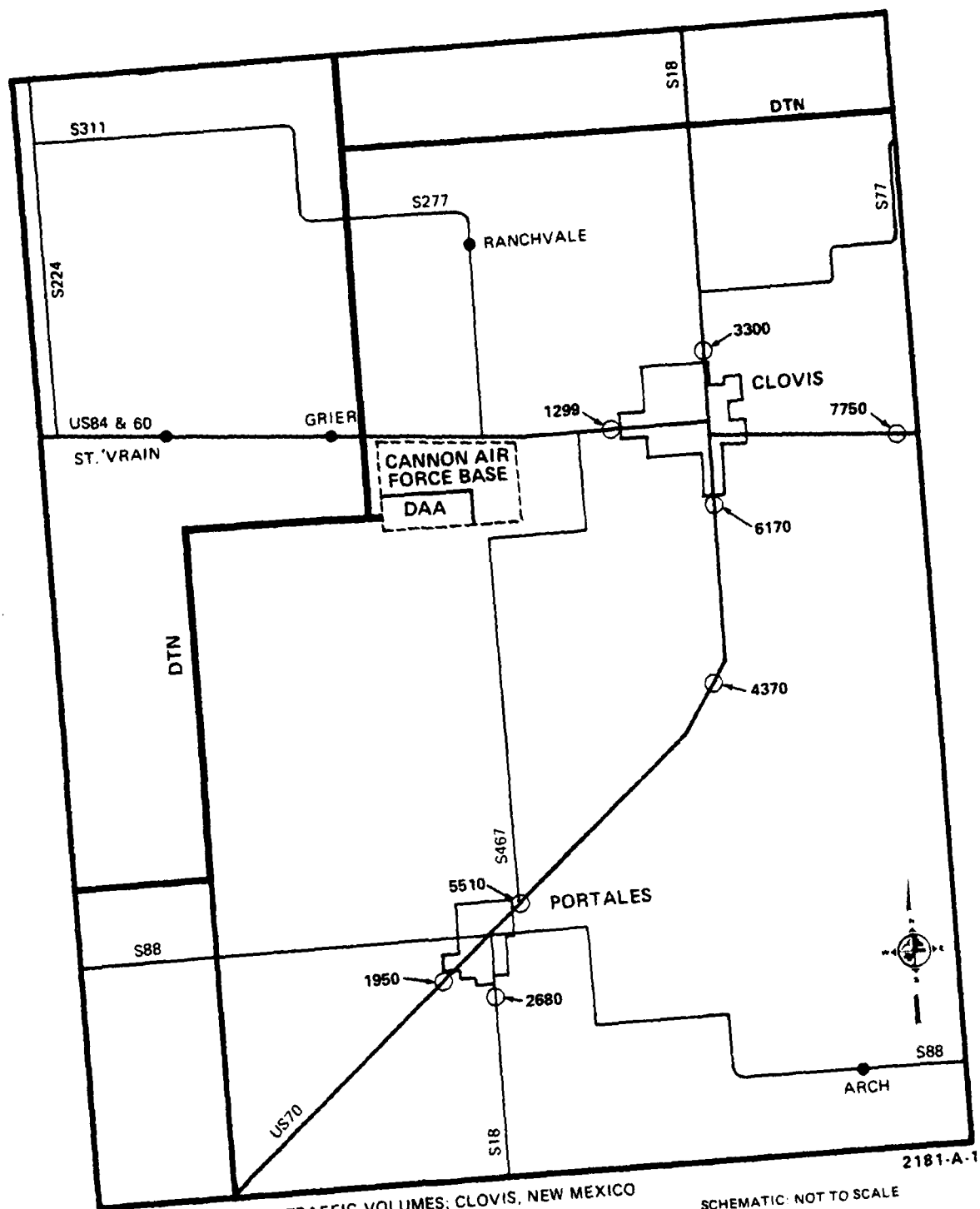
The Clovis operating base is located about 35 mi from the western escarpment of the High Plains. Fossil occurrences along the western escarpment are not common and consist mostly of gastropods and seeds.

#### **ARCHAEOLOGICAL AND HISTORICAL RESOURCES (1.1.12)**

The proposed construction area at Cannon AFB lies in an area known to have been occupied by hunter-gathers for at least the last 12,000 years. The archaeological resources of the Clovis area are poorly known; only 18 sites have been recorded in Curry County, none in the proposed construction area. However, this is a reflection of the volume of research which has been done there, as Roosevelt County to the south contains 296 recorded sties, one of which is on the National Register.

Curry County contains a variety of areas which are highly likely to contain potentially significant archaeological resources. These include branches of Frio, Mustang, Running Water, and Blackwater Draws and Tierra Blanca Creek, all of which may contain deposits dating from any cultural period, an area of sand hills in the south which is known to contain similar remains, hundreds of playas, along the edges of which many sites may be found. Forty-three percent of the total area of Curry County is predicted to be highly or moderately sensitive for archaeological resources (314 mi<sup>2</sup> high; 293 m<sup>2</sup> moderate).

Historic occupation in the Southern Plains began in 1540 with Spanish trading, missionary, and exploring parties. Ranching began in the 1880s and was predominant until the 1900's, when many ranches were cut up for farms. The temporary nature of early historic activities and the lack of sheltered areas for early outposts in the



LEGEND 000 - 1978 TRAFFIC VOLUMES, CLOVIS, NEW MEXICO  
 SOURCE: NEW MEXICO STATE HIGHWAY DEPARTMENT

SCHEMATIC: NOT TO SCALE

1.1.10-1. Traffic volumes in the vicinity of Clovis.

Clovis area suggests that remains from the Spanish/Mexican period are unlikely to exist. Later ranching and farming remains may exist, particularly near water sources. The ability of the historic inhabitants of the Southern Plains to drill for water, however, means that historic sites may exist nearly anywhere in the area. In addition, potentially significant historical remains such as fence or telegraph lines are not tied to specific topographic features. Virtually nothing is known about the historical resources of the area which may be significant for architectural reasons, although the Texas Tech University Historical Engineering Site Inventory noted the Belen Cutoff of the railroad and the A.T. and S.F. Railway Depot in Texico as noteworthy. Other architecturally significant remains may exist, particularly in Clovis.

## **1.2 NATURAL ENVIRONMENT**

### **BIOLOGICAL RESOURCES (1.2.1)**

The designated potential operating base will utilize Cannon Air Force Base and adjacent land, all of the latter presently used for agriculture. There is very little natural vegetation in the designated operating base area. The wildlife species present are those common to agricultural areas throughout the region, such as bobwhite quail and pheasant. There is no aquatic habitat present. There are no protected animal species reported in the area, although the central plains milk snake and Texas horned lizard may be present, as well as migrating birds of prey. No protected plants have been reported from the area. The nearest significant natural area is Grulla National Wildlife Refuge (established to protect the lesser sandhill crane), 20 mi (32 km) to the southeast and is closed to the public. There are extensive sandhills between the proposed base and Grulla National Wildlife Refuge. There are few biologically sensitive areas in the vicinity of Clovis. There are some playa lakes scattered in the area used by upland game for cover, by waterfowl for resting and feeding, and by wildlife in general for water. The biota of the Clovis area is characterized by forms tolerant of human activity.

### **SURFACE WATER (1.2.2)**

#### **Source**

There is no surface inflow of water, hence the only source of surface water is precipitation. Mean annual precipitation at Clovis is 18 in. Mean annual lake evaporation is 69 in. The wettest months are typically May and June, when warm, moist tropical air produces moderate to heavy thunderstorms which are often accompanied by hail. Snow occasionally occurs during the winter months, but is generally light and remains on the ground only a short while.

#### **Streams/Lakes and Reservoirs**

Except for the playa lakes, surface water supplies are practically non-existent. The playas are formed after water moving slowly over the flat terrain flows into the playa lakes. There it forms ponds and causes minor local flooding. No perennial surface flow exists within Curry County, the county in which Clovis is located.

## Drainage

Clovis is located in the headwater of the Brazos River which drains southeastward into the Gulf of Mexico.

## Current Use

Non-existent.

## GROUNDWATER (1.2.3)

### Location

The Clovis operating base site lies near the city of Clovis in Curry County, New Mexico. Nearly all of Curry County lies in the Southern High Plains region including three major river basins, the Arkansas-White-Red, Pecos and Texas Gulf (New Mexico SE, 1975).

The principal groundwater source is the Ogallala Formation consisting of a complex system of sand and gravel beds interspersed with silt, sand and caliche.

Total aquifer thickness is as much as 492 ft, while the zone of saturation ranges from a few ft to more than 300 ft. Depth to the water table ranges from less than 15 m to greater than 295 ft. A 1972 USGS map shows depth to the groundwater reservoir around Clovis to range from 197 ft to 525 ft (Bedinger and Sniegocki, 1976).

### Source

The vast majority of groundwater recharge is derived from precipitation. Estimates of that recharge range from  $4.2 \times 10^{-5}$  to  $4.3 \times 10^{-2}$  ft per year (Bedinger and Sniegocki, 1976). The small recharge is due to low amounts of precipitation and high evaporation rates along with the cemented caliche beds which underlie the top soil and prevent downward percolation to the groundwater table which is at great depth. Normal average precipitation is 1.3 ft per year.

### Current Use

Total water use is currently estimated to be  $1.3 \times 10^{10} \text{ ft}^3$  ( $3 \times 10^5 \text{ AF}$ ) per year. An estimate of the depletion rate is  $6.7 \times 10^{-3} \text{ ft}^3$ , and the amount of water in storage that is recoverable is estimated at  $2.5 \times 10^{11} \text{ ft}^3$  ( $5.8 \times 10^6 \text{ AF}$ ). (New Mexico SEO, 1975) In Clovis, 36 public supply wells consume an average of  $2.9 \times 10^8 \text{ ft}^3$  ( $6.7 \times 10^3 \text{ AF}$ ) per year with a peak capacity of  $2.1 \times 10^6 \text{ ft}^3$  ( $4.9 \times 10^1 \text{ AF}$ ) per day.

### Trend

Current and historical pumpage is removing and has removed large quantities of groundwater from storage resulting in large water level declines and associated significant reduction in well yields. At current depletion rates, fresh groundwater would be used up in 37 years although feasibility may prevent current usage rates to continue during the future as it becomes increasingly difficult to pump water. This feasibility problem is associated with increased pumping costs due to increasing lifts and decreasing yields.



## **Quality**

Groundwater in the Ogallala usually ranges from 400 to 1,200 mg/l TDS, while a measurement at Clovis in 1967 showed a reading of 283 mg/l TDS. Other sites in Curry County in 1967 showed a range of 245 to 625 mg/l TDS.

More detailed analyses are presented in the water resources technical study.

### **SOILS/SLOPE (1.2.4)**

The soils of the potential Clovis OB site formed from moderately sandy, calcareous materials on plains of nearly level to gently sloping and gently undulating relief. Slopes generally average less than 2 percent but may range up to 5 percent in some of the more undulating sections. The soils of this area belong primarily to the Amarillo-Clovis series association and are deep and moderately deep (U.S.D.A. Soil Conservation Service, September 1958). Calcium carbonate, leached from the upper layers of these soils, has accumulated at depths of 24 to 60 inches (60 to 150 cm) and formed a lime-enriched zone. Areas of the soils of this association are locally called "sandy row-crop land."

Soils of the Amarillo series cover by far the largest acreage of land in the Clovis study area. The Amarillo series consists of loam, fine sandy loam and loamy fine sand surfaces underlain by horizons of sandy clay loam, calcareous sandy clay loam and a white chalky zone of more than 50 percent calcium carbonate, occurring at depths of 42 to 60 inches (107 to 150 cm). At depths below 60 inches (150 cm), a massive, strongly calcareous loam or sandy clay loam layer often exists. The soils of the Clovis series occur to a much lesser extent than the Amarillo and differ primarily in that the chalky zone occurs at shallower depths (27 to 60 inches (69 to 150 cm)).

Loamy and fine sandy loam Amarillo and Clovis soils are used primarily for dryland farming and are the most productive soils in the county under dryland farming. If these soils are irrigated and fertilized, yields are generally high. The soils will be damaged by wind if they are not protected so a vegetative cover should be maintained during the windy season.

Loamy fine sand Amarillo and Clovis soils are very productive under dryland farming in years when there is enough rainfall but are poorly suited to irrigation. If these soils are not protected, wind erosion will damage them severely. In general, these soils are best suited to permanent pastures.

## **Seismicity**

The Clovis area is in a zone of low seismic risk. Seismic hazards result only from large earthquakes on distant faults, the most likely being along the Rio Grande lineament.

### **AIR QUALITY (1.2.5)**

New Mexico 1978 emissions data are available on a county basis. Data for Curry County, which includes the Clovis OB site, are given in Tables 1.2.5-1 through 1.2.5-5. Total particulate emissions for Curry County were listed as 1,510 tons per

Table 1.2.5-1. Baseline particulate emission levels in New Mexico.

REGION/COUNTY	STATIONARY SOURCES TONS/YR	MOBILE SOURCES TONS/YR	FUGITIVE DUST SOURCES TONS/YR	TOTAL TONS/YR	AREA OF COUNTY MI <sup>2</sup>	DENSITY = TOTAL/AREA TONS/YR/MI <sup>2</sup>
ACQR 155 Pecos-Permian Basin Intrastate						
Chaves	3,080	378	0	3,458	6,084	0.57
Curry	932	578	0	1,510	1,403	1.08
De Baca	346	42	0	388	2,356	0.16
Eddy	18,639	277	5	18,921	4,167	4.54
Lea	1,928	345	2	2,275	4,392	0.52
Quay	1,898	185	3	2,086	2,875	0.73
Roosevelt	61	129	9	199	2,454	0.08
ACQR 157 Upper Rio Grande Valley Intrastate						
Taos	9,735	128	10	9,873	2,256	4.38
ACQR 153 Las Cruces- Alamogordo Interstate						
Lincoln	58	105	22	185	4,858	0.04
Otero	4,356	955	30	5,341	6,638	0.80
ACQR 154 Northeastern Plains Interstate						
Colfax	10,355	126	17	10,498	3,764	2.79
Guadalupe	74	151	7	232	2,998	0.08
Harding	25	15	5	45	2,134	0.02
Mora	111	46	10	167	1,940	0.09
San Miguel	227	157	21	405	4,741	0.09
Torrance	49	143	15	207	3,346	0.06
Union	14	65	2	81	3,816	0.02

3300

Source: 1978 Area and Point Source Emission Summary for State of New Mexico

Table 1.2.5-2. Baseline SO<sub>2</sub> emission levels in New Mexico.

REGION/COUNTY	STATIONARY SOURCES TONS/YR	MOBILE SOURCES TONS/YR	NATURAL SOURCES TONS/YR	TOTAL TONS/YR	AREA OF COUNTY MI <sup>2</sup>	DENSITY = TOTAL/AREA TONS/YR/MI <sup>2</sup>
AQCR 155						
Pecos-Permian						
Basin Intrastate						
Chaves	339	238	0	577	6,084	.09
Curry	301	263	0	564	1,403	.40
De Baca	7	19	0	26	2,356	.01
Eddy	27,106	201	0	27,307	4,167	6.55
Lea	108,605	241	0	108,846	4,392	24.78
Quay	23	88	0	111	2,875	.04
Roosevelt	1,526	90	0	1,616	2,454	.66
AQCR 157						
Upper Rio Grande						
Valley Intrastate						
Taos	72	90	0	162	2,256	.07
AQCR 153						
Las Cruces-						
Alamogordo						
Intrastate						
Lincoln	16	54	0	70	4,858	.01
Otero	189	328	0	517	6,638	.08
AQCR 154						
Northeastern						
Plains Interstate						
Colfax	176	74	0	250	3,764	.07
Guadalupe	15	54	0	69	2,998	.02
Harding	5	9	0	14	2,134	.01
Mora	54	27	0	81	1,940	.04
San Miguel	53	103	0	156	4,741	.03
Torrance	10	58	0	68	3,346	.02
Union	14	36	0	50	3,816	.01

3301

Source: 1978 Area and Point Source Emission Summary for State of New Mexico.

Table 1.2.5-3. Baseline NO<sub>x</sub> emission levels in New Mexico.

REGION/COUNTY	STATIONARY SOURCES TONS/YR	MOBILE SOURCES TONS/YR	NATURAL SOURCES TONS/YR	TOTAL TONS/YR	AREA OF COUNTY MI <sup>2</sup>	DENSITY = TOTAL/AREA TONS/YR MI <sup>2</sup>
ACQR 155 Pecos-Permian Basin Intrastate						
Chaves	685	3,115	0	3,800	6,084	.62
Curry	249	2,748	0	2,997	1,403	2.14
De Baca	12	418	0	430	2,356	.18
Eddy	3,058	2,771	1	5,830	4,167	1.42
Lea	7,664	3,447	1	11,112	4,392	2.53
Quay	1,521	1,755	1	3,277	2,875	1.14
Roosevelt	204	1,310	1	1,515	2,454	.62
ACQR 157 Upper Rio Grande Valley Intrastate						
Taos	1,046	1,327	2	2,375	2,256	1.05
ACQR 153 Las Cruces- Alamogordo Interstate						
Lincoln	157	1,003	5	1,165	4,858	.24
Otero	208	3,133	7	3,348	6,638	.50
ACQR 154 Northeastern Plains Interstate						
Colfax	202	1,252	4	1,458	3,764	.39
Guadalupe	40	1,432	2	1,474	2,998	.49
Harding	15	156	1	172	2,134	.08
Mora	136	474	1	611	1,940	.32
San Miguel	195	1,586	5	1,786	4,741	.38
Torrance	35	1,340	4	1,379	3,346	.41
Union	752	648	1	1,401	3,816	.37

3302

Source: 1978 Area and Point Source Emission Summary for State of New Mexico.

Table 1.2.5-4. Baseline CO emission levels in New Mexico.

REGION-COUNTY	STATIONARY SOURCES TONS/YR	MOBILE SOURCES TONS/YR	NATURAL SOURCES TONS/YR	TOTAL TONS/YR	AREA OF COUNTY MI <sup>2</sup>	DENSITY = TOTAL/AREA TONS/YR MI <sup>2</sup>
ACQR 155 Pecos-Permian Basin Intrastate						
Chaves	553	19,413	0	19,964	6,084	3.28
Curry	465	15,867	0	16,332	1,403	11.64
De Baca	42	2,651	0	2,693	2,356	1.14
Eddy	5,384	16,214	39	21,637	4,617	5.19
Lea	931	20,092	20	21,043	4,392	4.79
Quay	140	11,285	27	11,452	2,875	3.98
Roosevelt	194	7,079	47	7,320	2,454	2.98
ACQR 157 Upper Rio Grande Valley Intrastate						
Taos	1,694	6,385	84	8,163	2,256	3.62
ACQR 158 Las Cruces Alamogordo Interstate						
Lincoln	117	6,327	181	6,625	4,858	1.36
Doña Ana	2,291	16,843	246	19,380	6,638	2.92
ACQR 159 Northeastern Plains Interstate						
Delfax	1,186	7,318	140	8,644	3,764	2.30
Madalaga	335	9,094	56	9,485	2,998	3.16
Harding	85	811	40	936	2,134	.44
Mora	116	2,300	26	2,442	1,940	1.26
San Miguel	1,334	9,224	176	10,734	4,741	2.26
Torrance	86	8,351	125	8,562	3,346	2.56
Valencia	57	3,577	18	3,645	3,816	.96

3303

Source: 1978 Area and Point Source Emission Summary for State of New Mexico.

Table 1.2.5-5. Baseline HC emission levels in New Mexico.

REGION/COUNTY	STATIONARY SOURCES TONS/YR	MOBILE SOURCES TONS/YR	NATURAL SOURCES TONS/YR	TOTAL TONS/YR	AREA OF COUNTY MI <sup>2</sup>	DENSITY = TOTAL/AREA TONS/YR/MI <sup>2</sup>
ACQR 115 Pecos-Permian Basin Intrastate						
Chaves	2,183	3,099	0	5,282	6,084	.87
Curry	878	3,016	0	3,894	1,403	2.78
De Baca	62	497	0	559	2,356	.24
Eddy	4,751	2,567	7	7,325	4,167	1.76
Lea	16,288	3,188	3	19,479	4,392	4.44
Quay	484	1,929	5	2,418	2,875	.84
Roosevelt	704	1,214	7	1,925	2,454	.78
ACQR 157 Upper Rio Grande Valley Intrastate						
Taos	1,096	1,112	14	2,222	2,256	.98
ACQR 153 Las Cruces- Alamogordo Interstate						
Lincoln	1,083	1,071	31	2,185	4,558	.45
Otero	1,215	4,042	42	5,299	6,638	.80
ACQR 154 Northeastern Plains Interstate						
Colfax	39	1,253	24	1,676	3,764	.45
Guadalupe	205	1,675	10	1,890	2,998	.63
Harding	71	151	7	229	2,134	.11
Mora	112	468	3	583	1,940	.30
San Miguel	613	1,561	30	2,224	4,741	.47
Torrance	599	1,549	21	2,169	3,346	.65
Union	207	631	3	841	3,816	.22

3304

Source: 1978 Area and Point Source Emission Summary for State of New Mexico.

year, including emissions from stationary, mobile, and fugitive dust sources. Gaseous emissions for the county were listed as the following:  $O_3$  emissions were 2,997 tons per year,  $SO_2$  emissions were 564 tons per year,  $CO$  emissions were 16,332 tons per year, and HC emissions were 3,894 tons per year.

No gaseous air quality monitoring data are available for the county of Clovis. Particulate monitoring data in 1977 showed levels above NAAQS levels.

Clovis, New Mexico and Dalhart, Texas have similar climate conditions with only a slight annual increase in visible dust frequency at Clovis. (See Table 1.2.5-6). Visible dust does become a problem at Clovis in March and April, however, when it appears 6 percent of time (an average of 3 hours every 2 days), mostly during daylight hours. More intense and frequent duststorms will result after an extremely dry winter.

Table 1.2.5-6. Monthly percent frequency of dust observation in Texas/New Mexico region.

STATION	PERCENTAGE OF HOURLY WEATHER OBSERVATIONS												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	ANN
TEXAS/NEW MEXICO													
Clovis, NM.	1.400	3.100	6.000	5.500	2.700	1.500	0.500	0.300	0.700	0.600	1.000	2.000	2.100
Clayton, NM.	2.400	0.620	3.348	1.541	0.427	0.284	0.061	0.061	0.346	0.065	0.068	0.304	0.610
Amarillo, TX.	0.700	2.100	2.400	3.200	1.100	0.700	0.300	0.100	0.400	0.400	0.600	1.300	1.200
Lubbock, TX.	2.900	4.500	7.700	7.600	4.500	2.800	0.500	0.200	0.500	0.500	1.400	3.400	3.100

832-1

Source: Orgill and Schmel (1975).



## **2.0 ENVIRONMENTAL CONSEQUENCES FOR THE OPERATING BASE VICINITY**

### **2.1 HUMAN ENVIRONMENT**

#### **EFFECTS ON EMPLOYMENT AND LABOR FORCE (2.1.1)**

Clovis is projected as a first operating base location under full deployment in Texas/New Mexico, and a second operating base under split deployment. Base-associated employment as well as some spillover employment from DDA construction in other counties represent the only sources of M-X-related employment in the county; no DDA facilities are located in Curry County.

##### **Direct, Indirect and Total M-X-Related Employment**

Principal employment effects result from the project's demand for construction and operations labor. Tables 2.1.1-1 and 2.1.1-2 present direct, indirect and total labor requirements for the two project alternatives which would site a base in Curry County. Table 2.1.1-1 indicates that construction of the first operating base would begin in 1982 and last for 5 years, peaking at 2,300 workers in 1984. This peak demand figure would be about 370 percent of 1977 employment levels in the county's construction industry. Peak construction demand of 2,300 jobs would be about 16 percent of baseline employment in the county in 1984. Employment demand of this magnitude would induce short run stress in the county's building trades industry, creating shortages of skilled workers, wage inflation, and immigration of workers into the county. Operation of the base would begin in 1984, with full base staffing of 7,500 persons by 1991 (Table 2.1.1-1). Under the split deployment alternative, where a second operating base would be sited at Clovis, total direct labor required would be much less, particularly over the initial build-up phase (See Table 2.1.1-2).

Large numbers of jobs indirectly related to M-X would also be created in the county. The principal source would be county-level expansion induced by the respending of project payrolls earned by direct employees. There would also be local procurement of goods and services from area suppliers, who in turn would expand employment to meet the increased demand. Project-related investments by governments and private business would also induce growth of secondary employment. Table 2.1.1-1 indicates that indirect employment would peak at 7,100 jobs in 1986, decline thereafter, until reaching about 1,400 jobs in 1991.

Table 2.1.1-1 indicates that peak total employment by place of work in the county is forecast to equal as much as 14,900 jobs in 1986, about equal to the trend-growth employment projections of 14,700 jobs in the county. Forecasts indicate that virtually all workers will reside in Curry County. Over the long-run, the M-X induced change in employment for Alternative 7 would equal 8,900 jobs. This figure represents a 60 percent increase above baseline employment forecast for that period. No large additional projects in Curry County appear likely during the same time period.

Curry County is projected by the University of New Mexico, Bureau of Business and Economic Research, to be a "no-growth" county through 1995. Growth induced by M-X would radically change this forecast. Because Cannon Air Force

Table 2.1.1-1. M-X related system employment by place of employment, Alternative 7, Curry County.

M-X RELATED SYSTEM EMPLOYMENT BY PLACE OF EMPLOYMENT, IN DEPLOYMENT REGION													
ALTERNATIVE 7, FULL DEPLOYMENT - TEXAS/NEW MEXICO (L)													
BASE I AT CLOVIS, NM (CURRY CO.)													
BASE II AT DALHART, TX (HARTLEY CO.)													
TYPE OF EMPLOYMENT	NUMBER OF JOBS												
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
TECHNICAL FACILITIES													
CONSTRUCTION	0	950	2600	8100	12050	13900	11750	3600	0	0	0	0	0
ASSEMBLY + CONSTRUC	0	50	150	1750	3150	3150	3100	3100	50	0	0	0	0
BASE													
CONSTRUCTION	1150	1900	2300	2200	2350	2050	1450	750	0	0	0	0	0
ASSEMBLY AND CHECKOUT	0	350	900	1000	2850	2850	2800	2650	50	0	0	0	0
OPERATIONS													
OFFICERS	0	0	100	200	400	600	850	1050	1050	1050	1050	1050	1050
ENLISTED PERSONNEL	0	0	950	1925	4000	6050	8050	10150	10150	10150	10150	10150	10150
CIVILIANS	0	0	200	375	750	1150	1600	2000	2000	2000	2000	2000	2000
TOTAL DIRECT	1150	3250	7200	16250	23750	29750	29600	23500	13500	13200	13200	13200	13200
INDIRECT	1596	4218	7880	14448	20502	23283	22189	15688	7962	5271	4948	4934	4934
TOTAL	2746	7468	15080	30798	46252	53033	51789	39188	21262	18471	18148	18134	18134
SOURCE: HDR SCIENCES, 31-OCT-80													

TOTAL CIVILIAN M-X RELATED EMPLOYMENT, AVAILABLE RESIDENT LABOR FORCE, AND NET CIVILIAN LABOR FORCE IMPACT BY PLACE OF RESIDENCE FOR DEPLOYMENT REGION													
ALTERNATIVE 7, FULL DEPLOYMENT - TEXAS/NEW MEXICO (L)													
BASE I AT CLOVIS, NM (CURRY CO.)													
BASE II AT DALHART, TX (HARTLEY CO.)													
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
TOTAL CIVILIAN													
M-X-RELATED EMPLOYMENT	2746	7468	14030	28674	41852	46384	42890	27786	10060	7270	6945	6931	6931
AVAILABLE RESIDENT LABOR FORCE	3280	3314	3348	3381	3411	3441	3472	3503	3536	3568	3598	3631	3663
NET CIVILIAN LABOR FORCE IMPACT	2153	6726	13098	27622	40997	45744	41775	26199	9199	7381	7209	7194	7187
SOURCE: HDR SCIENCES, 31-OCT-80													

Table 2.1.1-2. M-X related system employment by place of employment, Alternative 8, Curry County.

Base already is located in the county, however, much of the infrastructure needed to serve a major defensive installation already is in place. M-X-related growth would expand this existing service and trade structure. The city of Clovis would be the focus of much of this growth, though additional employment growth would be exported to the nearby city of Portales, in Roosevelt County.

### **Labor Force Impacts**

Skilled labor markets, e.g. ironworkers and operating engineers, could be very tight during peak construction activity leading to short-run, escalation of wages for these construction crafts. These labor shortages would extend to other occupations as more mobile workers would seek relatively higher wages paid on M-X jobs. Tables 2.1.1-3 and 2.1.1-4 present labor in-migration estimates for Curry County for those deployment options which site a base at Clovis. These in-migration estimates are very important since they form the basis for population in-migration, which in turn, derives impacts upon local infrastructure, a key determinant of impact magnitudes. Taking Table 2.1.1-3 as an example, total civilian M-X-related employment is presented in the first line, and represents direct and indirect labor demand presented in Table 2.1.1-1, plus any adjustment necessary for cross-county commuting. This figure peaks at 11,700 persons in 1986. In the same year, the county's available resident labor force is projected to equal about 450 persons, which includes the projected unemployed labor force less an estimate of those persons who are expected to remain unemployed even under extremely tight labor market conditions. The third line in Table 2.1.1-3, "net civilian labor force impact," is a comparison of the expected available labor pool in the county with M-X demand for labor. It represents cumulative labor in-migration into the county, which in 1986 is forecast to equal 11,400 persons, i.e., up to and including 1986, 11,400 civilian workers would in-migrate into the county. Thereafter, Table 2.1.1-3 indicates a decline in the "net civilian labor force impact" figure, indicating worker out-migration as job opportunities in the county diminish. The figure stabilizes at about 3,100 persons, the total or cumulative in-migration into Curry County over the period 1982-1994 under Alternative 7. Alternative 8 would generate smaller civilian in-migration estimates. Subsequent to peak in-migration, labor market stress would decline somewhat; unemployment rates could rise, labor force participation rates would fall, and the induced rise in particular wage levels, e.g., construction workers, would begin to diminish.

### **EFFECTS ON INCOME AND EARNINGS (2.1.2)**

Earnings impacts in Curry County are closely related to employment effects which were discussed in Section 2.1.1. Clovis, Curry County, New Mexico would be the site of a first operating base under Alternative 7 and a second operating base under Alternative 8, split deployment. The county is also within the DDA under both full and split deployment, but no construction camps would be located in the county, and since earnings impacts from DDA construction have been moderated on the basis of camp locations, Curry County is listed as not experiencing direct earnings impact from their incomes in the county, inducing growth in indirect earnings.

Under Alternative 7 peak earnings are forecast to reach over \$255 million in 1986, as Table 2.1.2-1 indicates. This figure is slightly more than 1978 total county earnings of \$254.8 million (1980 dollars). Earnings from M-X related activities

Table 2.1.1-3. Total civilian M-X related employment, available resident labor force, and net civilian labor force impact, by place of residence, Curry County, Alternative 7.

TOTAL CIVILIAN M-X RELATED EMPLOYMENT, AVAILABLE RESIDENT LABOR FORCE, AND NET CIVILIAN LABOR FORCE IMPACT BY PLACE OF RESIDENCE FOR CURRY													
ALTERNATIVE 7 FULL DEPLOYMENT - TEXAS/NEW MEXICO (L) BASE I AT CLOVIS, NM (CURRY CO ) BASE II AT DALHART, TX (HARTLEY CO )													
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
TOTAL CIVILIAN M-X-RELATED EMPLOYMENT	2317	5233	8314	11156	11681	9659	8893	6990	2901	2546	2536	2536	2536
AVAILABLE RESIDENT LABOR FORCE	449	451	452	453	454	454	454	454	455	454	453	452	451
NET CIVILIAN LABOR FORCE IMPACT	2044	5022	8064	10899	11377	9423	8679	6796	3186	3127	3137	3137	3138
SOURCE HDR SCIENCES. 31-OCT-80													

TOTAL CIVILIAN M-X RELATED EMPLOYMENT, AVAILABLE RESIDENT LABOR FORCE, AND NET CIVILIAN LABOR FORCE IMPACT BY PLACE OF RESIDENCE FOR CURRY													
ALTERNATIVE 8B SPLIT DEPLOYMENT (33/65)-TEXAS/NEW MEXICO(L) SPLIT BASE II AT CLOVIS, NM (CURRY CO )													
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
TOTAL CIVILIAN M-X-RELATED EMPLOYMENT	421	1462	4654	7368	9231	9498	8272	7552	4053	2577	2271	2264	2264
AVAILABLE RESIDENT LABOR FORCE	449	451	452	453	454	454	454	454	455	454	453	452	451
NET CIVILIAN LABOR FORCE IMPACT	197	1115	4437	7124	8973	9194	8034	7334	3934	2464	2465	2465	2465
SOURCE HDR SCIENCES. 31-OCT-80													

Table 2.1.1-4. Total civilian M-X related employment, available resident labor force, and net civilian labor force impact, by place of residence, Curry County, Alternative 8.

Table 2.1.2-1. M-X related earnings, Curry County, Alternative 7.

M-X RELATED EARNINGS, IN MILLIONS OF FY 1980 DOLLARS, IN CURRY  
 ALTERNATIVE 7: FULL DEPLOYMENT - TEXAS/NEW MEXICO (IL)  
 BASE I AT CLOVIS, NM (CURRY CO)  
 BASE II AT DALHART, TX (HARTLEY CO)

SOURCE OF EARNINGS	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLUSTER FACILITIES CONSTRUCTION, ASSEMBLY, AND CHECKOUT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BASE CONSTRUCTION, ASSEMBLY, AND CHECKOUT	38.4	72.6	112.2	111.6	71.3	70.0	56.3	1.3	0.0	0.0	0.0	0.0
OPERATIONS	0.0	0.0	1.4	34.3	69.0	86.3	103.7	103.7	103.7	103.7	103.7	103.7
INDIRECT	15.2	30.8	63.9	90.0	78.8	66.9	41.5	22.1	10.1	18.0	18.0	18.0
TOTAL	53.6	111.4	187.4	235.9	219.0	223.2	211.4	127.1	121.8	121.7	121.7	121.7
SOURCE: MOR SCIENCES, 3-NOV-80												

M-X RELATED EARNINGS, IN MILLIONS OF FY 1980 DOLLARS, IN CURRY  
 ALTERNATIVE 8B: SPLIT DEPLOYMENT (33/63)-TEXAS/NEW MEXICO  
 SPLIT BASE II AT CLOVIS, NM (CURRY CO)

SOURCE OF EARNINGS	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLUSTER FACILITIES CONSTRUCTION, ASSEMBLY, AND CHECKOUT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BASE CONSTRUCTION, ASSEMBLY, AND CHECKOUT	0.0	16.3	79.7	114.4	120.9	94.1	52.5	50.0	1.3	0.0	0.0	0.0	0.0
OPERATIONS	0.0	0.0	0.0	17.4	33.1	51.1	67.3	83.6	83.6	83.6	83.6	83.6	83.6
INDIRECT	3.5	11.9	27.3	44.4	41.5	72.8	70.5	60.5	40.3	21.8	17.8	17.7	17.7
TOTAL	3.5	28.2	107.0	176.2	215.6	217.9	190.3	194.1	125.2	105.4	101.4	101.4	101.4
SOURCE: MOR SCIENCES, 31-OCT-80													

Table 2.1.2-2. M-X related earnings, Curry County, Alternative 8.

stabilize at \$121 million. Of the peak impact of \$255 million, 64 percent is generated by direct employment in the county, i.e., base construction and operation, and the remaining is generated from indirect employment. In the long term the contribution of direct operations personnel earnings reaches 85 percent.

Under the split deployment option, Clovis would be the site of the second operating base. Table 2.1.2-2 indicates that earnings are forecast to peak at almost \$218 million, which is only slightly less than the level forecast for the county under full deployment. Long run earnings amount to \$101 million which represents 83 percent of the long run level attained under Alternative 7. There are no direct impacts from construction of cluster facilities. In the peak impact year of 1987, 43 percent of total M-X related earnings are contributed by base construction activity, with indirect earnings contributing an additional 33 percent. In the long run, the indirect contribution is roughly halved, falling to 18 percent of the total earnings.

### **EFFECTS ON PUBLIC FINANCE (2.1.3)**

This section presents the aggregate expenditure, revenue, and net impact levels estimated for all local governments in the Curry County area. Peak year and long-term capital expenditure requirements also are presented. The effects discussed reflect aggregate estimates and cannot be interpreted as estimates associated with a specific jurisdiction. However, impacts specific to the local school district constitute a major portion of the aggregate effects and are discussed separately.

The net fiscal effects in the Curry County area are greatest under Alternative 7 where the first operating base is proposed. Peak year deficits (1985) of approximately \$1.9 million are anticipated (Table 2.1.3-1) representing approximately 4.4 percent of the total expenditure levels anticipated at this time. Under Alternative 8 where a smaller second operating base is proposed, deficits are slightly less (\$1.5 million).

These deficits estimated under both alternatives could result in serious service level degradation, particularly in the early years of the project (1982-1986) unless substantial outside aid and/or mitigative measures are available. No significant adverse effects are anticipated in the long-term under any of the alternatives.

Effects on the education system in Curry County follow similar patterns. Maximum effects are anticipated under Alternative 7. Deficits are estimated in the early years of the project (1982-1984) and surplus projected in the later years (Table 2.1.3-2). Short-term deficits in the early years of the project can affect the provision of education services in the areas unless immediate aid is made available to the local schools. Under Alternative 8, estimated deficits in the early years are slightly less but still have the potential for serious service level degradation if aid is not available in the early years of the project. Though excess revenues are estimated through 1994 this situation is contingent upon continued funding of state and federal educational aid programs.

Capital expenditure requirements for full deployment, Alternative 7, and split deployment Alternative 8 are presented for the Curry County area in Table 2.1.3-3. Total long term capital expenditures under Alternative 7 for the Curry County area

Table 2.1.3-1. Local government revenues, expenditures and net impacts, Alternatives 7 and 8, Curry County.

LOCAL GOVERNMENT REVENUES, EXPENDITURES, AND NET IMPACTS (THOUSANDS FY 1980 \$) (1) BASELINE LOW													
CURRY COUNTY													
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
ALTERNATIVE 7													
REVENUES													
WITHIN ME	2660.	2768.	2837.	2925.	2997.	2996.	2963.	2975.	2994.	2937.	2887.	2787.	2786.
OUTSIDE ME	2660.	2768.	2837.	2925.	2997.	2996.	2963.	2975.	2994.	2937.	2887.	2787.	2786.
DIFFERENCE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
PCT. DIFF.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
EXPENDITURES													
WITHIN ME	2887.	2858.	2869.	2870.	2873.	2876.	2879.	2872.	2881.	2873.	2870.	2869.	2859.
OUTSIDE ME	3100.	3093.	3093.	3093.	3093.	3093.	3093.	3093.	3093.	3093.	3093.	3093.	3093.
DIFFERENCE	213.	225.	226.	228.	226.	227.	226.	227.	227.	226.	227.	224.	234.
PCT. DIFF.	7.7%	8.1%	7.9%	7.8%	7.5%	7.6%	7.6%	7.6%	7.6%	7.7%	7.8%	8.0%	8.4%
NET IMPACT	-527.	-1110.	-1032.	-1897.	-1210.	-1111.	-162.	-1256.	-1534.	-1361.	-1361.	-1361.	-1361.
ALTERNATIVE 8													
REVENUES													
WITHIN ME	2660.	2768.	2837.	2925.	2997.	2996.	2963.	2975.	2994.	2937.	2887.	2787.	2786.
OUTSIDE ME	2660.	2768.	2837.	2925.	2997.	2996.	2963.	2975.	2994.	2937.	2887.	2787.	2786.
DIFFERENCE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
PCT. DIFF.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
EXPENDITURES													
WITHIN ME	2887.	2858.	2869.	2870.	2873.	2876.	2879.	2872.	2881.	2873.	2870.	2869.	2859.
OUTSIDE ME	3100.	3093.	3093.	3093.	3093.	3093.	3093.	3093.	3093.	3093.	3093.	3093.	3093.
DIFFERENCE	213.	225.	226.	228.	226.	227.	226.	227.	227.	226.	227.	224.	234.
PCT. DIFF.	7.7%	8.1%	7.9%	7.8%	7.5%	7.6%	7.6%	7.6%	7.6%	7.7%	7.8%	8.0%	8.4%
NET IMPACT	-527.	-1110.	-1032.	-1897.	-1210.	-1111.	-162.	-1256.	-1534.	-1361.	-1361.	-1361.	-1361.

SOURCE: HWY SCIENCES  
 (1) ESTIMATES REFLECT AGGREGATE REVENUES AND EXPENDITURES FOR ALL LOCAL GOVERNMENTAL UNITS (COUNTIES, CITIES, SCHOOLS, DISTRICTS, SPECIAL DISTRICTS) WITHIN THE COUNTY.

10-OCT-89

Table 2.1.3-2. School district revenues, expenditures and net impacts, Alternatives 7 and 8, Curry County.

SCHOOL DISTRICT REVENUES, EXPENDITURES, AND NET IMPACTS (THOUSANDS FY 1983 \$) (1) BASELINE: LOW COUNTY: CURRY														
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
<b>ALTERNATIVE 7</b>														
REVENUES														
AID FROM STATE	22804	22877	22950	23023	23096	23169	23242	23315	23388	23461	23534	23607	23680	23753
AID FROM LOCAL	26200	26256	26312	26368	26424	26480	26536	26592	26648	26704	26760	26816	26872	26928
TOTAL REVENUE	49004	49133	49262	49391	49520	49649	49778	49907	50036	50165	50294	50423	50552	50681
PCT. DIFF.	14.44	14.44	14.44	14.44	14.44	14.44	14.44	14.44	14.44	14.44	14.44	14.44	14.44	14.44
EXPENDITURES														
AID FROM STATE	21054	21136	21218	21300	21382	21464	21546	21628	21710	21792	21874	21956	22038	22120
AID FROM LOCAL	26949	27005	27061	27117	27173	27229	27285	27341	27397	27453	27509	27565	27621	27677
TOTAL EXPENDITURE	48003	48141	48279	48417	48555	48693	48831	48969	49107	49245	49383	49521	49659	49797
PCT. DIFF.	8.17	8.17	8.17	8.17	8.17	8.17	8.17	8.17	8.17	8.17	8.17	8.17	8.17	8.17
NET IMPACT	-441	-441	-441	-441	-441	-441	-441	-441	-441	-441	-441	-441	-441	-441
<b>ALTERNATIVE 8</b>														
REVENUES														
AID FROM STATE	22804	22877	22950	23023	23096	23169	23242	23315	23388	23461	23534	23607	23680	23753
AID FROM LOCAL	26182	26238	26294	26350	26406	26462	26518	26574	26630	26686	26742	26798	26854	26910
TOTAL REVENUE	48986	49115	49244	49372	49500	49628	49756	49884	50012	50140	50268	50396	50524	50652
PCT. DIFF.	14.44	14.44	14.44	14.44	14.44	14.44	14.44	14.44	14.44	14.44	14.44	14.44	14.44	14.44
EXPENDITURES														
AID FROM STATE	21054	21136	21218	21300	21382	21464	21546	21628	21710	21792	21874	21956	22038	22120
AID FROM LOCAL	26949	27005	27061	27117	27173	27229	27285	27341	27397	27453	27509	27565	27621	27677
TOTAL EXPENDITURE	48003	48141	48279	48417	48555	48693	48831	48969	49107	49245	49383	49521	49659	49797
PCT. DIFF.	8.17	8.17	8.17	8.17	8.17	8.17	8.17	8.17	8.17	8.17	8.17	8.17	8.17	8.17
NET IMPACT	-441	-441	-441	-441	-441	-441	-441	-441	-441	-441	-441	-441	-441	-441

\*\*\*\*\*  
 SOURCE: HIGH SCHOOL DISTRICTS  
 (1) ESTIMATES BASED ON REVENUES AND EXPENDITURES BY ALL SCHOOL DISTRICTS WITHIN THE COUNTY.  
 10-OCT-83



Table 2.1.3-3. M-X related capital expenditure requirements, Alternatives 7 and 8, Curry County.

M-X RELATED CAPITAL EXPENDITURE REQUIREMENTS (THOUSANDS FY 1980 \$) BASELINE 1.74			
CURRY COUNTY SERVICE	LONG TERM (1994)	ANNUAL INVESTMENT REQUIRED (1)	PEAK YEAR
ALTERNATIVE 7			
GENERAL OBLIGATION BOND ITEMS (2)	6404.7	6144.5	19220.6
REVENUE BOND ITEMS (3)	5196.2	5196.2	12139.8
SCHOOLS	2311.0	1977.8	26116.0
TOTAL	30011.9	13720.4	97176.4
ALTERNATIVE 8			
GENERAL OBLIGATION BOND ITEMS (2)	6711.0	5971.3	17140.4
REVENUE BOND ITEMS (3)	5088.6	1682.9	11061.5
SCHOOLS	23620.0	5903.0	52611.5
TOTAL	35379.6	13559.1	80813.4

(1) BASELINE ANNUAL INVESTMENT REQUIRED  
(2) GENERAL OBLIGATION BOND ITEMS INCLUDE POLICE, FIRE, GOVERNMENT, HEALTH SERVICE, LIBRARY,  
AND SUPER EXPENDITURES.  
(3) REVENUE BOND ITEMS INCLUDE WATER AND WASTEWATER FACILITY EXPENDITURES.  
SOURCE: HDR SCIENCES, 10-OCT-80

amount to \$36.0 million. Capital outlays for school facility development account for 67 percent of total expenditures. Under the split deployment alternative, long term capital expenditures of \$35.4 are estimated, only 2 percent less than Alternative 7. Peak year capital expenditure requirements for the Curry County will range from \$54.0 million under Alternative 8 to \$57.2 million for Alternative 7.

The level of capital expenditure requirements estimated for the Curry County area when compared to the reserve bonding capacities of the various jurisdictions indicates the inability of the areas to finance projects necessary to support infrastructure growth in both the peak years and for the long-term. Federal assistance will be required to maintain current service standard levels. While peak year costs are substantially higher than long term outlays (approximately 53-58 percent greater), the use of temporary facilities and/or other mitigative strategies can reduce these capital expenditures substantially.

#### **EFFECTS ON POPULATION AND COMMUNITIES (2.1.4)**

The population effects of an operating base near Clovis, New Mexico, which would be the greatest for Alternative 7 when the first operating base is proposed, are projected to occur primarily within Curry County, although some spillover effects would be experienced in adjacent Roosevelt County. The M-X-related in-migrant population generated in Curry County by the base is projected to reach a maximum during the construction "boom" of about 26,600 in 1986, an increase of 60 percent over the trend growth baseline population projected that year, as shown in Table 2.1.4-1. During the five year construction "boom" period from 1982 through 1986, Curry County's growth rate would be increased to 10.3 percent annually, compared to a trend growth rate of less than one percent annually for the same period. In the long term, out-migration of construction related population would reduce the total to a permanent level of approximately 18,900 persons, 43 percent above the projected baseline population. The effects of Alternative 8, the split deployment alternative, would be slightly less.

The construction-related population projected to be present in Curry County would total about 5,400 persons in 1986, the peak year, although as many as 6,300 would be in the county in 1985. The number present in the peak year represents about 20 percent of all project related in-migrants, while the equivalent proportions for military operations and civilian indirect and operations populations would be 30 percent and 49 percent, respectively (Table 2.1.4-2). The construction related population, a large share of whom would be workers present without families, would likely have higher incomes, a slightly larger family household size, and younger age distribution than the general population (Mountain West Research, Inc., 1975), while the military related population would contain a large share of single persons and have a younger age structure and lower average income (at least for enlisted personnel) than the general population. The civilian operations and indirect population generated by project related expansion of local economic activity would likely approximate the characteristics of the population of the western United States. The construction-related and indirect populations are projected to be temporarily present in Curry County, with the permanent in-migrants comprised entirely of military and civilian operations workers and their families. About 43 percent of the in-migrants present in the peak year (11,400 persons) are projected to be civilian labor force participants and another 22 percent (5,800) would be school-age population. In the long term, about 17 percent of the 18,900 permanent in-

Table 2.1.4-1. Projected baseline population and cumulative M-X related in-migration by alternative, Curry County, assuming trend baseline.

PROJECTED BASELINE POPULATION AND CUMULATIVE M-X RELATED IN-MIGRATION BY ALTERNATIVE, IN CARRY ASSUMING TREND BASELINE													
ALTERNATIVE / POPULATION	1982	1981	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASELINE POPULATION	41876	45010	44150	44290	44110	44110	44151	44110	44110	44110	44210	44110	44110
ALTERNATIVE 7													
M-X IN-MIGRATION	3755	9260	16344	24216	26594	25069	25555	23111	18081	18211	18214	18014	18014
TOTAL POPULATION	47625	51270	61094	68506	70804	69179	69705	67221	62191	62321	62424	62124	62124
PERCENT DIFFERENCE FROM BASELINE	8.6	21.0	18.4	54.7	60.0	56.6	51.5	51.5	42.8	42.7	42.8	42.9	41.0
ALTERNATIVE 80													
M-X IN-MIGRATION	3674	8641	16009	21884	24512	23521	24505	22806	18717	18667	18668	18668	18668
TOTAL POPULATION	47494	57451	60159	66174	68842	67651	68855	66016	61117	61221	61221	61221	61110
PERCENT DIFFERENCE FROM BASELINE	8.1	19.6	16.3	49.4	55.4	51.1	51.1	50.9	42.2	42.1	42.2	42.1	42.4

SOURCE: HDR SCIENCES, 21-OCT-80

PROJECTED CUMULATIVE POPULATION IN MIGRATION BY PROJECT RELATED EMPLOYMENT CATEGORY, BY ALTERNATIVE, IN CARRY  
ASSUMING TREND BASELINE

ALTERNATIVE / CATEGORIES	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
ALTERNATIVE 7													
BASE CONSTRUCTION	2432	4262	5127	4501	2567	0	0	0	0	0	0	0	0
CLUSTER CONSTRUCTION	0	0	0	0	0	0	0	0	0	0	0	0	0
ASSEMBLY & CHECKOUT	0	350	900	1800	2850	2850	3000	2630	50	0	0	0	0
MILITARY OPERATIONS	0	0	2640	5343	8046	10487	13327	15967	15967	15967	15967	15967	15967
CIVILIAN OPERATIONS	0	0	307	796	1286	1846	2406	2966	2966	2966	2966	2967	2967
INDIRECT	1303	4648	7870	11775	11842	9607	7022	2148	0	0	0	0	0
TOTAL	3735	9260	16944	24216	26594	25069	23555	21731	18783	18731	18734	18734	18734
ALTERNATIVE 80													
BASE CONSTRUCTION	0	398	4140	5467	4501	2569	0	0	0	0	0	0	0
CLUSTER CONSTRUCTION	0	0	0	0	0	0	0	0	0	0	0	0	0
ASSEMBLY & CHECKOUT	0	250	700	1350	2150	2150	2100	2000	30	0	0	0	0
MILITARY OPERATIONS	0	0	0	2640	5155	7951	10309	12950	12950	12950	12950	12950	12950
CIVILIAN OPERATIONS	0	0	0	306	726	1286	1846	2266	2266	2266	2266	2267	2267
INDIRECT	418	1346	2809	4616	7053	8711	8401	6105	2809	0	0	0	0
TOTAL	418	1995	7650	14379	19585	22637	22636	23321	18074	15216	15216	15217	15217

\*EMPLOYMENT CATEGORY IS FOR PRIMARY WORKER IN HOUSEHOLD SOURCE: HDR SCIENCES, 1 NOV 80

Table 2.1.4-2. Projected cumulative population in-migration by project related employment category, by alternative, Curry County, assuming trend baseline.

migrants would be civilian labor force participants and another 29 percent are projected to school-age population.

The projected M-X-related in-migrant population at the county level has been disaggregated to two spatial categories of residence: the operations base and local communities, with a portion of the transient construction population accommodated in temporary facilities on the base (Table 2.1.4-3). In 1986, the peak year, about 63 percent of the in-migrants present (16,800 persons) would require accommodations in local communities, while the remainder would be housed onbase. In the long term only about one-third of the project-related population is projected to reside in Curry County's communities, with two-thirds accommodated on the operations base. The community population generated within Curry County by the proposed base in Alternatives 7 and 8 is most likely to be absorbed in the Clovis area and in the vicinity of the Melrose community.

A small population effect from the base near Clovis would also be experienced in adjacent Roosevelt County, most likely in the vicinity of Portales. The projected long term population effect in Roosevelt County is approximately 800 persons.

## **EFFECTS ON LAND USE (2.1.5)**

### **Community Land Use**

Clovis in Curry County, New Mexico will experience long term impacts under Alternatives 7 and 8 since it will be the site of an OB I and OB II under the respective alternatives. Neighboring Roosevelt County will also experience long term impacts under both alternatives attributable to spillover effects from Curry County. For both counties the major differences are not between different options but between the timing of the requirements. See Table 2.1.5-1 for a description of the community land requirements generated by direct and indirect M-X activity.

#### Alternatives 7 and 8

Alternative 7 has land requirements peaking in 1985 with about 2,500 acres. Requirements for Alternative 8 are about four-fifths of those for Alternative 7 and peak two years later. The demands commence in 1982 for Alternative 7 at a level of approximately 450 acres and thereafter increase rapidly to the peak. Around 1990, upon the completion of base construction activity, the long term demand for about 1,000 acres remains. The greatest consumer of land is housing which takes about one half of all land needs throughout the project. Of this residential land, mobile homes predominate in the majority of the early years, exceeding the number of permanent housing units. In the long run, however, mobile homes utilize only 15 percent of the housing land requirements.

### **Availability of Land**

Community land requirements of the project under both alternatives, the effects on vacant land, and percentage growth for the developed acreage is presented in Table 2.1.5-2. On a countywide basis, the peak year urban land requirement of 2,528 acres under Alternative 7 exceeds the total vacant urban land available. Currently the vacant land constitutes only 22 percent of total area but the M-X land requirements equal almost 30 percent of presently-developed land and almost 23 percent of total urban land area.

Table 2.1.4-3. Projected cumulative population in-migration by place of residence, by alternative, Curry County, assuming trend baseline.

PROJECTED CUMULATIVE POPULATION IN-MIGRATION BY PLACE OF RESIDENCE, BY ALTERNATIVE, IN CURRY ASSUMING TREND BASELINE													
ALTERNATIVE / PLACE OF RESIDENCE	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
ALTERNATIVE 7													
CONSTRUCTION CAMP'S	0	0	0	0	0	0	0	0	0	0	0	0	0
OPERATIONS BASE	508	1232	4074	7007	9819	11399	13461	15424	12824	12774	12774	12774	12774
LOCAL COMMUNITIES	3247	8028	12830	17209	16775	13670	12093	8307	6159	6159	6160	6160	6161
TOTAL	3755	9260	16904	24216	26594	25069	25555	23731	18983	18933	18934	18934	18934
ALTERNATIVE 8B													
CONSTRUCTION CAMP'S	0	0	0	0	0	0	0	0	0	0	0	0	0
OPERATIONS BASE	0	332	1357	4594	7206	9018	10348	12360	10410	10360	10360	10360	10360
LOCAL COMMUNITIES	418	1662	6092	9785	12379	13618	12308	10961	7664	4856	4856	4857	4857
TOTAL	418	1995	7450	14379	19585	22637	22656	23321	18074	15216	15216	15217	15217

SOURCE: HMR SCIENCES, 1-NOV-80

Table 2.1.5-1. Cumulative M-X related land requirements by use category, by alternative, Curry County, assuming trend baseline.

CUMULATIVE M-X RELATED LAND REQUIREMENTS (ACRES) BY USE CATEGORY, BY ALTERNATIVE IN CURRY ASSUMING TREND BASELINE													
ALTERNATIVE / LAND USE CATEGORY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
ALTERNATIVE A													
PERMANENT HOMES	66	176	272	430	440	538	702	583	469	469	469	469	469
MOBILE HOMES	160	401	661	874	849	573	383	155	85	85	85	85	85
SUBTOTAL	226	577	933	1304	1289	1111	1085	738	554	554	554	554	554
RETAIL/COMM / INDUS	23	47	75	99	100	84	83	72	43	42	42	42	42
STIS AND HAYS	149	380	618	852	841	704	628	431	318	318	318	318	318
PUBLIC/INSTITUTIONAL	57	135	211	273	261	208	185	133	101	101	101	101	101
TOTAL	435	1138	1837	2530	2492	2107	1930	1374	1017	1014	1014	1014	1014
ALTERNATIVE BB													
PERMANENT HOMES	7	31	142	258	333	511	712	767	600	368	368	368	368
MOBILE HOMES	25	92	287	452	591	564	346	221	109	67	67	67	67
SUBTOTAL	32	123	429	710	924	1075	1058	988	709	435	435	435	435
RETAIL/COMM / INDUS	3	12	41	67	81	83	75	72	50	39	37	37	37
STIS AND HAYS	21	82	201	461	603	604	644	582	408	250	250	250	250
PUBLIC/INSTITUTIONAL	6	26	106	169	203	216	185	169	122	80	80	80	80
TOTAL	62	243	857	1408	1810	2060	1963	1812	1289	804	802	802	802

SOURCE: IDWR SCIENCES, 1-NOV-80

Table 2.1.5-2. M-X urban land requirements and impacts, Curry County, by alternative.

ALTERNATIVE* (TYPE OF FACILITY)	CURRENT URBAN LAND**			PEAK YEAR			LONG TERM		
	VACANT (ACRES)	DEVELOPED (ACRES)	TOTAL (ACRES)	LAND REQUIREMENT		PROJECTED VACANT LAND	LAND REQUIREMENT		PROJECTED VACANT LAND
				ACRES	% OF DEVELOPED LAND		ACRES	% OF DEVELOPED LAND	
7 (OB I)	2,475	8,545	11,020	2,528	29.6	-53	1,014	11.9	1,461
8 (OB II)	2,475	8,545	11,020	2,060	24.1	415	802	9.4	1,673

3884

\*Only representative alternatives are listed.

\*\*Includes land within existing incorporated and unincorporated communities.

Source: Personal contact with Eastern Plains Council of Governments, October 30, 1980.

Under Alternative 8 when Clovis is the site of OB II the M-X community land requirements are somewhat reduced; about 2,000 acres or 81 percent of the level under Alternative 7. Guidance for the location of future urban growth in the county is available from the General Plan for the City of Clovis (currently in the process of revision) prepared in the late 1960s. The policies in this document encourage orderly growth as opposed to urban sprawl and recommend the utilization of vacant or unindustrialized land within the city prior to other lands. It is expected that these policies will be updated in the forthcoming revisions to the general plan.

The impact upon the individual communities of Curry County will be substantial. Clovis, as the largest city will receive the greatest portion of the land area requirements but vacant land in Clovis currently totals less than 1,500 acres, substantially less than the peak year demand of 2,500 acres under Alternative 7. Texico, about 10 mi to the east of Clovis, has only 250 acres of vacant land. A large portion of the land for housing may be met by a scattering of mobile homes and temporary structures in the unincorporated areas of the county. The impact of these structures and the pressures they represent on agricultural land and land ownership patterns is likely to be negative. The enforcement and stringency of the subdivision regulations and the zoning code will determine the extent to which such impacts will occur.

In light of the above circumstances the impact upon community land availability at the countywide level is adverse. A similar conclusion is valid for the availability of vacant land in each of the individual communities. Annexation and conversion of rural land to urban uses will serve to mitigate this effect to some degree but such actions are likely to be accompanied by negative impacts upon agricultural land.

Spillover community land requirements projected for Roosevelt County are 617 acres in 1987 under Alternative 7. The effect of this demand on the availability of urban land has not been determined at this time. However, it is expected that the City of Portales would receive most of the impact.

Table 2.1.5-2 presents information on the effects of M-X long term requirements under Alternatives 7 and 8 on vacant land. On a countywide basis the requirements under Alternative 7 and 8 represent about a 60 percent decline from the peak period requirements. This decline is not large enough to diminish the negative effects of the requirements on the countywide availability of vacant land. The amount of vacant land still available in Curry County following the development of the M-X induced urban growth would leave only about 13 percent of the land as vacant; a proportion considered to be low for baseline growth. Annexation of additional land could act in resolving this problem.

#### **Other Impacts**

The construction period will cause significant growth in Curry County but the impacts will not be as severe as those upon the availability of vacant land. The peak period land requirements represent a 30 percent increase in the amount of developed land. Under Alternative 7 the impacts for this growth will be most apparent over the four years from 1982-1985. The most significant demands from this growth will be posed upon the planning institutions in Clovis. The land use planning problems detailed elsewhere for other proposed OB locations are also expected in the Clovis area.



## **Conclusions**

Peak community land requirements under Alternative 7 and 8 exceed the quantities of vacant land currently (1980) available in Curry County. Guidance in directing the location of growth will be forthcoming in the Clovis General Plan revisions (now in the early stages of preparation). Projected impacts upon Clovis and other communities in Curry County is adverse. Scattered development is expected to be detrimental to agricultural land use and land ownership patterns. Spillover impacts will extend into Roosevelt County. Long term requirements, although lower than peak demands, will not allow sufficient quantities of land to be available for baseline growth. Annexation can aid in meeting the land availability problems in the peak and long term periods. Rapid growth will have highly significant impacts upon Clovis. Inefficient land use patterns and conflicting land uses can be expected.

## **Rural Land Use**

This section will discuss two types of rural land uses that could be affected by a potential operating base near Clovis, New Mexico. They are agriculture and recreation.

### **Agriculture**

Figure 2.1.5-1 shows the potential operating base near Clovis and the croplands in the area. Table 2.1.5-3 shows the number of acres of each type of cropland that would be occupied by the potential base facilities, and the number of acres of each cropland type within the suitability zone around the potential base.

It can be seen that the base would occupy 3,500 acres of irrigated cropland, and 2,880 acres of dry cropland. The suitability zone has no additional farmland because it includes nothing more than Cannon AFB. The 3,520 acres represents 2.4 percent of the irrigated cropland in Curry County, and the 2,880 acres represents 0.7 percent of the dry cropland in Curry County. Neither of these acres are considered to be of significant impact.

### **Recreation**

No fishing or concentrated recreational areas are located on the proposed OB site or within the suitability envelope. Dispersed recreational activities are probably not permitted by the owners of the affected land.

The basing at Clovis is expected to increase the population in Curry County by 60 percent over baseline projections by the peak year of 1986. An equivalent increase in recreational demand is expected. Outdoor recreational sites expected to receive the major portion of this increase in demand are Summer Lake, Ute Lake and Oasis State Park. Each of these sites are within an hour's driving time and thus of easiest access.

Baseline projections indicate that each of these sites are expected to need added camping and picnicking facilities (New Mexico SCORP, 1978). The added M-X demand is expected to significantly increase the need.

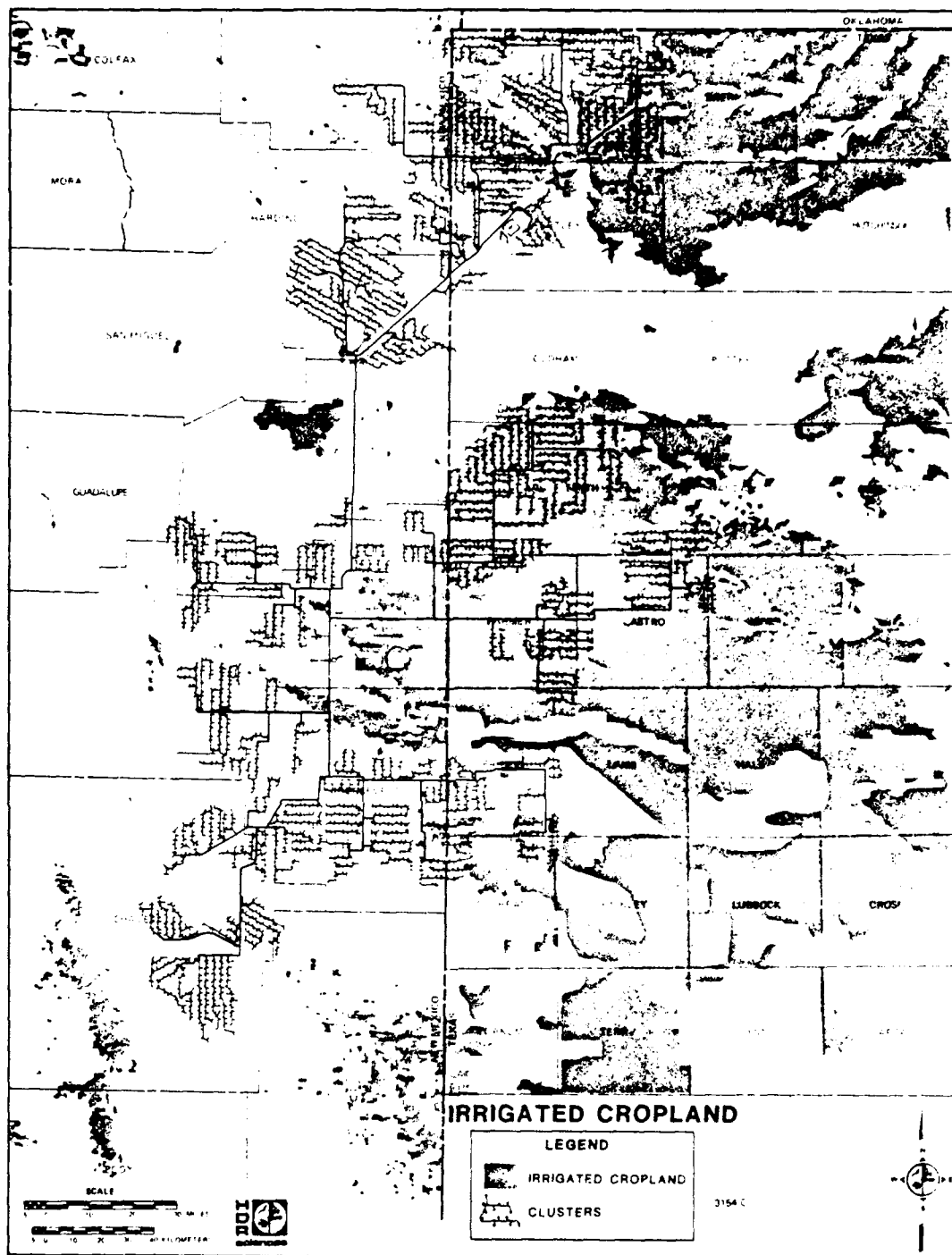


Figure 2.1.5-1. Cropland and operating base in the vicinity of Clovis, New Mexico.

Table 2.1.5-3. Cropland uses at potential operating base facilities, New Mexico.

CROPLAND TYPE	OB, DAA AND OBTS FACILITIES		SUITABILITY ZONE <sup>1</sup>	
	ACRES	PERCENT OF OB	ACRES	PERCENT OF ZONE
Irrigated	3,520	55	3,520	36
Dry	2,800	45	2,880	29
Total	6,400	100	6,400	65

3864-1

<sup>1</sup>Includes area of Cannon AFB

Source: New Mexico State Engineer's Office, 1979

Over time the increase in population will level off to roughly 43 percent over baseline projections. Although this decrease will reduce recreational demands compared to peak year levels, this will still represent a significant demand increase over baseline figures.

#### **EFFECTS ON LAND OWNERSHIP (2.1.6)**

Figure 1.1.5-1 shows the potential operating base at Clovis, New Mexico, and the land ownerships in the area. Table 2.1.6-1 shows the number of acres of land of each ownership type that would be occupied by the potential operating base and facilities, and the number of acres of each type within the suitability zone around the potential base.

It can be seen that all of the area of the operating base facilities would be located on private land. Because the suitability zone extends easterly only, onto Cannon AFB, 25 percent of the suitability zone is DOD land. It is intended that M-X share the runway facilities with Cannon AFB.

The 6,400 acres of private land required for the potential operating base are equal to 0.8 percent of the private land in Curry County. This is not considered to be a significant impact.

#### **EFFECTS ON HOUSING (2.1.7)**

The cumulative total M-X related housing unit requirements in local communities, by type of structure, and by alternative, for Curry County, New Mexico, are given in Table 2.1.7-1. Under the full-deployment scenario, Alternative 7, Curry County can expect large and immediate housing demands as a result of the OB I near Clovis, reaching a peak of 6,125 units in 1985, comprised of 1,090 single family units, 666 multi-family units, and 4,369 mobile homes. Thereafter, requirements decline, most noticeably in 1987, and then again in 1989, to attain a long term level of 2,129 units, consisting of 1,277 single-family units, 426 multi-family units, and 426 mobile homes. The resultant surpluses largely represent no longer needed mobile homes, some of which can be moved and presumable used to meet M-X requirements elsewhere in the deployment region; however, significant numbers of permanent housing units are also involved, which are likely to be problematic, especially since the trend growth baseline requirements are expected to also fall and create small surpluses from 1991 onwards.

The split-deployment Alternative 8, has a peak-year housing requirement of 5,558 units, some 91 percent of the full-deployment alternatives' peak-year requirements. The total includes 1,046 single-family units, 637 multi-family units, and 3,875 mobile homes. After the peak year, 1986, requirements fall off quickly, especially in 1989, to reach a long term steady-state level of 2,068 units, only about 3 percent less than the full-deployments' long term needs. As with the full-deployment alternative, absorbing and or disposing of the large housing unit surpluses will present a problem, although this will be mitigated to a degree by the fact that most of the surplus is expected to be in mobile homes.

With an operating base located near Clovis in Curry County, Roosevelt County, New Mexico, can also anticipate long term housing requirements as a result of spillover effects. These will amount to some 310 housing units (186 single-family, 62 multi-family, and 62 mobile homes) by 1994.

Table 2.1.6-1. Land ownership at potential operating base facilities at Clovis, New Mexico.

OWNERSHIP TYPE	OB, DAA AND OBTS FACILITIES		SUITABILITY ZONE	
	ACRES	PERCENT	ACRES	PERCENT
DOD <sup>1</sup>	0	0	3,440	35
Private	6,400	100	6,400	65
State	0	0	0	0
BLM	0	0	0	0
Total	6,400	100	9,840	100

3859-1

<sup>1</sup>Cannon AFB

Source: Panhandle Regional Planning Commission, 1978.

Table 2.1.7-1. Cumulative M-X related housing unit requirements in local communities by housing type, by alternative, Curry County, assuming trend baseline.

CUMULATIVE M-X RELATED HOUSING UNIT REQUIREMENTS IN LOCAL COMMUNITIES BY HOUSING TYPE, BY ALTERNATIVE, IN CURRY ASSUMING TREND BASELINE													
ALTERNATIVE / HOUSING TYPE	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASLINE REQUIREMENTS	15202	15350	15299	15348	15354	15361	15360	15375	15386	15354	15327	15299	15271
ALTERNATIVE 7													
SINGLE FAMILY UNITS	166	428	463	1090	1117	1308	1841	1373	1217	1277	1277	1277	1277
MOBILE HOMES	107	326	310	666	685	751	877	587	426	426	426	426	426
TOTAL M-X RELATED	273	754	773	1756	1802	2059	2718	1960	1643	1703	1703	1703	1703
M-X PLUS BASELINE	15274	16106	16077	17413	17040	17419	16238	16935	16512	16781	16753	16725	16697
ALTERNATIVE 8B													
SINGLE FAMILY UNITS	16	74	332	635	844	1315	1867	2065	1636	1004	1004	1005	1005
MOBILE HOMES	129	461	1434	2262	2756	2820	1730	793	545	335	335	335	335
TOTAL M-X RELATED	145	535	1766	2897	3599	4135	3597	2858	2181	1339	1339	1340	1340
M-X PLUS BASELINE	15347	15885	17045	18310	17639	17854	16635	17293	16793	16123	16092	16069	16040

SOURCE: HMR SCIENCES, 1-NOV-80

## EFFECTS ON COMMUNITY INFRASTRUCTURE (2.1.8)

M-X deployment Alternatives 7 and 8 identify a potential operating base location in the vicinity of Clovis (Curry County), New Mexico. Construction of such a facility would result in the in-migration of construction workers and their families in the short term, as well as long-term base personnel. This population in-migration will place additional demands on community infrastructure necessitating the recruitment of more teachers, health care personnel, law enforcement and fire personnel. There will also be impacts on parks and recreation and on basic utilities such as water and solid waste disposal, creating the need for expanded or new facilities. The accommodation of M-X related needs for community services will be fulfilled primarily by Curry County. Neighboring counties, for the most part, will experience lesser demands of a temporary nature. For that reason the following discussion will concentrate upon the effects likely to be experienced in Curry County under Alternatives 7 and 8.

### Education

Curry County is comprised of four school districts. However, primary effects attributable to M-X-related activities are anticipated to center mainly upon Clovis Municipal School District. As a result, this discussion will focus upon this district, although effects may also be experienced by those which are adjacent, but to a lesser extent. Clovis Municipal School District, which currently maintains an enrollment capacity of approximately 10,200, is expected to experience enrollment demands in excess of capacity under projected normal growth conditions prior to 1982. This indicates that any additional demands attributable to M-X would result in stresses to the local educational system above the level which would occur under normal growth conditions.

Table 2.1.8-1 presents the number of school-aged children expected by grade group for M-X alternatives between the years 1982 and 1994 on an annual basis. As indicated, in 1982, Alternatives 7 and 8 may each add up to between 890 and 935 additional pupils to the school district, an increase of between 7.5 and 8.5 percent over the 11,400 students expected under baseline growth. By 1989, the year of peak enrollment growth attributable to M-X, the percentage increase over baseline growth for Alternatives 7 and 8 may range between approximately 50.0 (Alternative 7) and 52.0 percent (Alternative 8). At this time, it is expected that nearly 11,550 resident school-aged children will be in need of educational services.

Subsequent to peak year enrollment demands resulting from M-X, enrollment levels can be expected to stabilize, the level of which may be useful for long range educational planning purposes. Table 2.1.8-1 indicates that the Clovis and adjacent school districts may have to provide long-term educational services for between 16,800 (Alternative 8) and 16,900 pupils (Alternative 7), of which approximately 32.0 percent would be attributable to M-X, should an operating base be located near Clovis.

Table 2.1.8-2 indicates the number of teachers which may be required to accommodate baseline and M-X-related enrollment demand on a class group basis for all years between 1982 and 1994. Alternatives 7 and 8 may initially require between 35 and 40 additional teachers to accommodate M-X-related enrollment increases in 1982, nearly 250 by 1988, and between 225 and 230 to accommodate

Table 2.1.8-1. Projected baseline and M-X induced school enrollments by grade level, by alternative, Curry County, assuming trend baseline.

PROJECTED BASELINE AND M-X INDUCED SCHOOL ENROLLMENTS BY GRADE LEVEL, BY ALTERNATIVE, IN CURRY ASSUMING TREND BASELINE													
ALTERNATIVE / NUMBER PUPILS BY GRADE LEVEL	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASELINE ENROLLMENTS													
ALTERNATIVE 7	11406	11442	11479	11515	11520	11525	11531	11536	11544	11520	11499	11479	11438
K-6	466	1050	1235	2484	2804	2773	2961	2927	2711	2711	2711	2711	2711
7-9	233	923	948	1243	1443	1387	1481	1443	1356	1356	1356	1356	1356
10-12	233	923	948	1243	1443	1387	1481	1443	1356	1356	1356	1356	1356
TOTAL M-X RELATED	932	3100	3671	5372	5772	5447	5923	5654	5422	5422	5422	5422	5422
M-X PLUS BASELINE	12338	13542	15350	16887	17292	17072	17453	17390	16966	16942	16921	16901	16860
PERCENT DIFFERENCE FROM BASELINE	8.2	18.4	33.7	46.7	50.1	48.1	51.4	50.7	47.0	47.1	47.1	47.2	47.3
ALTERNATIVE 08													
K-6	437	190	840	1641	2174	2553	2587	2798	2457	2185	2185	2185	2185
7-9	21	93	474	821	1088	1276	1294	1399	1233	1092	1092	1092	1092
10-12	21	93	474	821	1088	1276	1294	1399	1233	1092	1092	1092	1092
TOTAL M-X RELATED	84	379	1497	2562	4352	5105	5175	5596	4724	4370	4370	4370	4370
M-X PLUS BASELINE	11490	11821	13176	14797	15872	16630	16706	17132	16478	15890	15869	15849	15828
PERCENT DIFFERENCE FROM BASELINE	0.7	3.3	14.8	28.5	37.8	44.3	44.9	48.5	42.7	37.9	38.0	38.1	38.1

SOURCE: IBER SCIENCES, 1-NOV-80

PROJECTED BASELINE AND M-X INDUCED TEACHER REQUIREMENTS BY GRADE LEVEL, BY ALTERNATIVE, IN CURRY ASSUMING TREND BASELINE													
ALTERNATIVE / NUMBER TEACHERS BY GRADE LEVEL	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASELINE REQUIREMENTS													
ALTERNATIVE 7	510	520	521	523	523	523	524	524	524	523	522	521	520
K-6	19	42	77	107	115	111	118	117	108	108	103	100	100
7-9	10	23	42	58	63	60	64	64	59	59	59	59	59
10-12	11	24	44	61	66	63	67	67	62	62	62	62	62
TOTAL M-X RELATED	39	89	163	227	244	234	250	247	229	229	229	229	229
M-X PLUS BASELINE	549	609	684	750	767	757	774	771	753	752	751	750	749
PERCENT DIFFERENCE FROM BASELINE	7.5	17.1	31.2	43.4	46.6	44.7	47.7	47.1	43.6	43.7	43.8	43.9	44.0
ALTERNATIVE 08													
K-6	2	8	34	66	87	102	103	112	99	87	87	87	87
7-9	1	4	18	36	47	55	56	61	54	47	47	47	47
10-12	1	4	19	37	49	58	59	64	56	50	50	50	50
TOTAL M-X RELATED	4	16	72	139	184	216	219	236	208	185	185	185	185
M-X PLUS BASELINE	553	625	756	889	951	973	993	1007	962	937	936	935	934
PERCENT DIFFERENCE FROM BASELINE	0.8	3.1	13.8	26.6	33.1	41.2	41.8	43.0	39.6	35.3	35.4	35.5	35.5

SOURCE: IBER SCIENCES, 1-NOV-80

Table 2.1.8-2. Projected baseline and M-X induced teacher requirements by grade level, by alternative, Curry County, assuming trend baseline.



long-term demands. Since nearly 520 teachers would be required to accommodate just the projected long-term demands under a normal growth posture, the total long-term teacher requirement will approximate 750. It is possible that Clovis Municipal School District may encounter problems in attracting and retaining a staffing level of this magnitude.

### **Health Care**

M-X project related requirements for health care personnel and facilities are shown in Table 2.1.8-3 for Curry County. Under Alternative 7 with the first base located near Clovis, the need for health care personnel peaks in 1985, when 22 physicians, 69 nurses, 7 dentists, 4 mental health personnel and 57 additional hospital beds would be required. These requirements would be somewhat smaller under Alternative 8. M-X related peak demand increases the normal baseline growth requirements by about 35 percent and could cause some short-term problems in the provision of adequate health care in the county. In the long run, demand decreases to 4 physicians, 13 nurses, 1 dentist, and 11 hospital beds forming about 6 percent of the normal baseline demand.

Location of an operating base near Clovis would have some spillover population in Roosevelt County, New Mexico. The peak year demand in this county would be 15 additional health care personnel and 10 hospital beds, about 15 percent of the normal growth requirements.

### **Public Safety**

Tables 2.1.8-4 and 2.1.8-5 present the requirements for law enforcement and fire personnel in Curry County resulting from the M-X project. Curry County police and fire personnel requirements peak in 1986 and 1985, respectively, under both Alternatives 7 and 8. The number of additional law enforcement personnel is expected to be 60.2 percent under Alternative 7 and 55.7 percent under Alternative 8 above the number projected to be needed under normal growth conditions in the peak year. An increase of this size will likely place significant burdens on the existing law enforcement system. Problems of crowded facilities, particularly jails and of attracting and keeping enough qualified people to serve as deputies and police officers will be critical ones.

M-X related fire personnel requirements reach a level 38.4 percent over baseline in the peak year under Alternative 7 and 34.2 percent under Alternative 8. This sizable increase is likely to cause strain on the existing fire protection services. With the influx of a large population the fire protection force may find it difficult to continue to provide adequate fire protection, particularly for scattered mobile homes and large commercial buildings.

Subsequent to peak year demands on public safety services the out-migration of construction workers will occur resulting in a continuing decrease at the county level in total personnel requirements attributable to M-X deployment. Personnel requirements in Curry County stabilize and reach a steady state around 1990. This is the level of impact which can be most usefully mitigated through long range planning. The aforementioned tables indicate the number of police and fire personnel that will be required in the long term and the percent over baseline requirements that they represent. M-X induced public safety personnel require

Table 2.1.1.8-3. Projected baseline and M-X related health services and hospital bed requirements, Curry County, assuming trend baseline.

PROJECTED BASELINE AND M-X RELATED HEALTH SERVICES AND HOSPITAL BED REQUIREMENTS, IN CURRY ASSUMING TREND BASELINE													
ALTERNATIVE / REQUIREMENTS	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
<b>BASLINE</b>													
PHYSICIANS	65	66	66	66	66	66	66	66	66	66	66	66	66
REGISTERED NURSES	197	198	198	199	199	199	199	199	199	199	199	199	199
DENTISTS	23	23	23	23	23	23	23	23	23	23	23	23	23
MENTAL HEALTH PERSON	11	11	11	11	11	11	11	11	11	11	11	11	11
HOSPITAL BEDS	175	176	176	177	177	177	177	177	177	177	176	176	176
<b>ALTERNATIVE 7</b>													
PHYSICIANS	3	10	16	22	21	17	14	7	4	4	4	4	4
REGISTERED NURSES	12	32	51	69	66	51	42	23	13	13	13	13	13
DENTISTS	1	3	5	7	7	6	5	2	1	1	1	1	1
MENTAL HEALTH PERSON	0	2	3	4	4	3	2	1	0	0	0	0	0
HOSPITAL BEDS	9	25	41	57	56	46	37	20	11	11	11	11	11
<b>ALTERNATIVE 8B</b>													
PHYSICIANS	0	2	7	11	15	17	15	12	7	3	3	3	3
REGISTERED NURSES	1	7	24	37	47	52	46	37	22	10	10	10	10
DENTISTS	0	0	2	3	5	5	5	4	2	1	1	1	1
MENTAL HEALTH PERSON	0	0	1	2	2	3	2	2	1	0	0	0	0
HOSPITAL BEDS	1	6	17	28	38	44	41	33	20	9	9	9	9

SOURCE: MDR SCIENCE, 1 NOV 80

Table 2.1.8-4. Projected baseline and M-X related requirements for law enforcement personnel, by alternative, Curry County, assuming trend baseline.

PROJECTED BASELINE AND M-X RELATED REQUIREMENTS FOR LAW ENFORCEMENT PERSONNEL BY ALTERNATIVE, IN CURRY ASSUMING TREND BASELINE													
ALTERNATIVE / PERSONNEL REQUIREMENTS	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASELINE REQUIREMENTS	87	88	89	89	89	89	89	89	89	89	89	89	89
ALTERNATIVE 7													
M-X REQUIREMENTS	7	14	21	40	53	50	51	47	38	37	37	37	37
M-X PLUS BASELINE	94	102	110	129	142	139	140	136	127	126	126	126	126
PERCENT DIFFERENCE FROM BASELINE	8.0	15.7	23.4	54.5	59.8	56.4	57.5	53.0	42.8	41.8	41.8	41.9	42.0
ALTERNATIVE 8B													
M-X REQUIREMENTS	0	4	15	28	32	45	45	46	36	30	30	30	30
M-X PLUS BASELINE	87	92	103	116	127	133	133	134	124	119	119	119	119
PERCENT DIFFERENCE FROM BASELINE	0.0	4.5	17.0	31.6	44.0	50.6	50.7	51.8	40.5	33.9	33.9	34.0	34.0

SOURCE: HDR SCIENCES, 1-NOV 80

PROJECTED BASELINE AND M-X RELATED REQUIREMENTS FOR FIRE PROTECTION PERSONNEL BY ALTERNATIVE, IN CURRY ASSUMING TREND BASELINE													
ALTERNATIVE / PERSONNEL REQUIREMENTS	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASELINE REQUIREMENTS	72	72	72	73	73	73	73	73	73	73	72	72	72
ALTERNATIVE 7													
M-X REQUIREMENTS	5	13	21	28	27	27	20	13	10	10	10	10	10
M-X PLUS BASELINE	77	85	93	101	100	100	93	86	83	83	82	82	82
PERCENT DIFFERENCE FROM BASELINE	6.9	17.9	29.0	38.3	36.9	30.1	27.3	17.8	13.7	13.7	13.7	13.7	13.8
ALTERNATIVE 8B													
M-X REQUIREMENTS	0	2	10	16	20	22	20	10	12	8	0	0	0
M-X PLUS BASELINE	72	74	82	89	93	95	93	83	85	81	80	80	80
PERCENT DIFFERENCE FROM BASELINE	0.0	2.8	13.9	21.9	27.4	30.1	27.3	13.7	16.4	10.9	11.0	11.0	11.0

SOURCE: HDR SCIENCES, 1-NOV 80

Table 2.1.8-5. Projected baseline and M-X related requirements for fire protection personnel, by alternative, Curry County, assuming trend baseline.

ments for the period 1990 to 1994 represent a significant increase over the projected baseline requirements. In Curry County long term needs can possibly be accommodated with sufficient advance planning and funding, however, the level of need will require substantial and permanent expansion of police and fire facilities and personnel.

### **Parks and Recreation**

M-X induced population in-migration into the Clovis area will create an increased demand for both urban and regional parks and recreational facilities in Curry County. This increase in demand could stress existing urban facilities, as recreational facilities are just adequate to serve the present population. Thus to meet the increased needs planning funds and land will be required. The land requirements for expansion of local recreational facilities are presented in Table 2.1.8-6.

The projected population growth due to M-X would increase the peak year land requirements for recreation and parks by 106 acres and the long-term requirements by 39 acres if Clovis is chosen as the site for the first operating base. The corresponding figures would be 97 acres and 39 acres if it is chosen as the site for the second operating base. Additional rural acreage may be required for such recreational pursuits as off-road vehicular activity in order to spare habitats of rare and endangered species of plants and wildlife. The U.S. Forest Service could open more lands for informal outdoor activities such as hunting, fishing and camping. Also, through subdivision and Planned Unit Development ordinances a community can require certain amounts of recreation or open space in housing and mobile home development.

### **Solid Waste Disposal**

M-X induced in-migration to Curry County will create additional quantities of solid wastes not only in residences but also in the additional business and governmental activities required to support this population increment.

M-X related land requirements for solid waste disposal are presented in Table 2.1.8-7. If Clovis is chosen as the site for the first operating base, the M-X induced population demand for solid-waste disposal land area will begin in 1982. About 32 acres of landfill areas will provide for the M-X induced solid waste stream in Curry County through 2009, that is over the 20-year operational life of the M-X system. Negligible reduction in land requirement would occur if Clovis is chosen as the site of the second operating base.

### **EFFECTS ON QUALITY OF LIFE (2.1.9)**

The impact projections are conditional in that they are contingent on the actions taken by policy makers and also on the basic assumptions concerning factors such as the levels and pace of development which will occur. Moreover, the components of quality of life are numerous and complex and there is a great deal of uncertainty as to the probable outcomes since the basic models are lacking. Individual preference functions are unknown and community preference functions are hard to ascertain. Nevertheless, an attempt has been made to provide comparisons, within the framework of certain assumptions, suggestive of the trend of growth impacts on the communities in question.

Table 2.1.8-6. Projected M-X related land requirements for parks and play-grounds, by alternative, Curry County, assuming trend baseline,

PROJECTED M-X RELATED LAND REQUIREMENTS FOR PARKS AND PLAYGROUNDS, BY ALTERNATIVE, IN CURRY ASSUMING TREND BASELINE													
ALTERNATIVE / LAND REQUIREMENTS	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
ALTERNATIVE 7													
PLAYGROUNDS	3	0	13	17	17	14	12	8	6	6	6	6	6
NEIGHBORHOOD PARKS	4	10	17	22	22	18	16	11	8	8	8	8	8
COMMUNITY PARKS	13	32	51	69	67	55	48	33	23	23	23	23	23
TOTAL	20	50	81	108	106	87	76	52	39	39	39	39	39
ALTERNATIVE 8B													
PLAYGROUNDS	0	2	6	10	12	14	12	11	8	5	5	5	5
NEIGHBORHOOD PARKS	1	2	8	13	16	19	16	14	10	6	6	6	6
COMMUNITY PARKS	2	7	24	39	50	54	49	44	31	19	19	19	19
TOTAL	3	11	30	62	78	86	77	69	49	30	30	30	30

SOURCE: HDR SCIENCES, 1-NOV-80

Table 2.1.8-7. Projected baseline and M-X related land requirements (acres) for solid waste disposal, by alternative, in Curry County, assuming trend baseline.

PROJECTED BASELINE AND M-X RELATED LAND REQUIREMENTS (ACRES) FOR SOLID WASTE DISPOSAL, BY ALTERNATIVE, IN CURRY ASSUMING TREND BASELINE													
ALTERNATIVE LAND REQUIREMENTS	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASELINE REQUIREMENTS	6.6	6.6	6.6	6.6	6.6	6.6	6.7	6.7	6.7	6.6	6.6	6.6	6.6
ALTERNATIVE 7													
M-X REQUIREMENTS	0.5	1.2	1.9	2.6	2.5	2.1	1.8	1.2	0.9	0.9	0.9	0.7	0.9
M-X PLUS BASELINE	7.1	7.8	8.5	9.2	9.1	8.7	8.5	7.9	7.6	7.5	7.5	7.3	7.5
PERCENT DIFFERENCE FROM BASELINE	7.6	18.2	28.7	39.1	37.6	31.6	27.1	18.0	13.5	13.5	13.6	13.6	13.6
ALTERNATIVE 8B													
M-X REQUIREMENTS	0.1	0.2	0.9	1.5	1.9	2.0	1.8	1.6	1.1	0.7	0.7	0.7	0.7
M-X PLUS BASELINE	6.7	6.8	7.5	8.1	8.5	8.6	8.5	8.3	7.8	7.3	7.3	7.3	7.3
PERCENT DIFFERENCE FROM BASELINE	1.5	3.0	13.6	22.6	28.6	30.1	27.1	24.0	16.5	10.5	10.6	10.6	10.6

SOURCE: HDM SCIENCES, 4-MOV-80

The rapid population growth that can be anticipated if an operating base is located in the vicinity of Clovis will result in many objective and subjective changes in the quality of life in the surrounding communities. Figure 2.1.9-1 attempts to show potential changes in the quality of life that might reasonably be expected. The histograms portray an assessment of the impact on the quality of life, as measured by a particular index, in a range from acceptable to unacceptable. The four segments of the figure depict: (a) Baseline I, which simply portrays the county's particular index value as a proportion of the corresponding state index value (where acceptable denotes a value that is 50 percent better than the state figure, and unacceptable represents a value that is 100 percent worse than the state figure), for Baseline II quality of life indices; (b) Baseline II, the anticipated changes in these indices without M-X deployment in the county, but with normal projected population growth; (c) anticipated changes during the M-X construction phase compared to Baseline II; and (d) anticipated changes during the M-X operations phase over Baseline II. Changes in the indices are assumed to be related to the rapidity of population growth. Since the quality of life literature points to a rapid deterioration of social organization with boomtown growth, it is assumed that such indices as crime, alcohol and substance abuse, divorce and suicide rates, may increase as much as four times the average annual population growth rate. The economic well-being indices, e.g., per capita income, the unemployment rate, and the public assistance ratio (the proportion of the population on public assistance of some kind), on the other hand, are assumed to change at only double the annual average population change rate. The remaining indices, housing conditions (a measure of overcrowding), school overcrowding (the ratio of pupils to teachers), health care (doctors, dentists and registered nurses per 1,000 population, the number of hospital beds per 1,000 population), and public safety (ratio of police officers to population), collectively referred to as the community service indices, are all assumed to change inversely and linearly with the compound annual rate of population change.

#### **Quality of Life Without M-X**

It is estimated that Curry County will grow at a 0.1 percent compound annual growth rate between 1980 and 1992. Such a rate of increase will alter the quality of life in Curry County, which, with the exception of the per capita income, health care and public safety indices, ranked better than the New Mexico average. Certainly no overtaxing of community services and housing should be anticipated, and no social disorganization be encountered. Likewise no really noticeable change in the economic well being indices should be expected (Figure 2.1.9-1, upper right quadrant, which shows the Baseline II profile over Baseline I).

#### **Quality of Life During the M-X Construction Phase**

Assuming that an operating base is located near Clovis, a peak cumulative influx of about 24,000 people is projected for Curry County, which will produce a peak cumulative population change of 55 percent over baseline in 1988. Up to this peak year, population will be growing at a 10.5 percent compound annual growth rate. This fairly rapid growth rate can be expected to adversely affect housing conditions and to tax community services, bringing the latter under New Mexico averages. Increased social disorganization can be anticipated and will probably be reflected in higher crime, alcohol and substance abuse, divorce and even suicide rates, all of which were previously at or below state figures. The baseline crime and alcohol and substance abuse rates were considerably below New Mexico's index

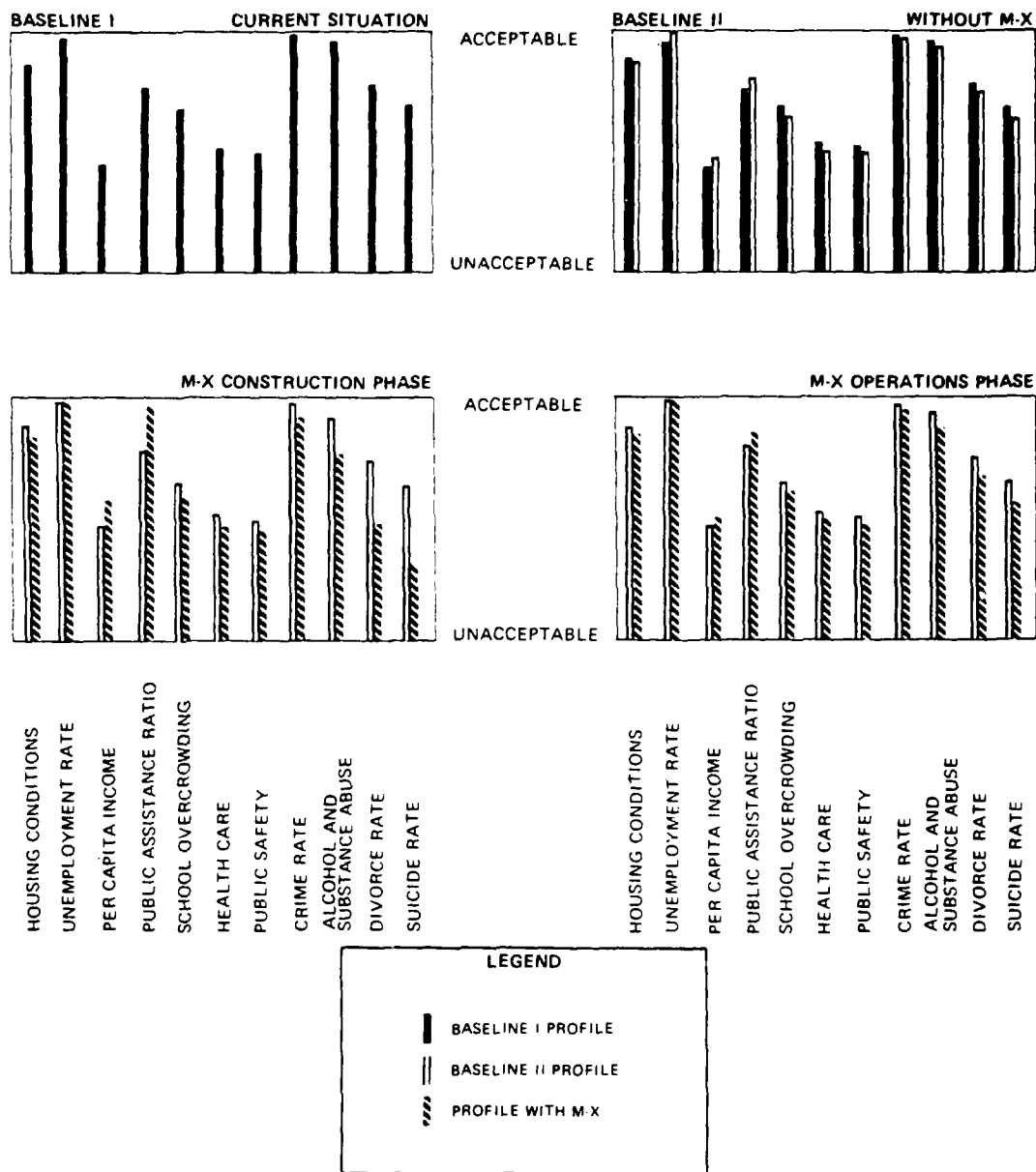


Figure 2.1.9-1. Potential changes in the Quality of Life profiles of Curry County, New Mexico.



averages. Consequently, while there will be a diminution in the quality of life, on balance Curry County will still have better than average quality of life scores on these two indices. Schools are likely to be faced with a large influx of children thus increasing the student to teacher ratio (Figure 2.1.9-1, lower left quadrant).

Conversely, considerable improvement in the economic well being aspects of the quality of life can reasonably be anticipated with such a growth rate. Unemployment rates, already below New Mexico's average rate, can be expected to fall further, as can the proportion of the population on public assistance. Some substantial increases in per capita incomes may also be brought about, but perhaps not enough to raise Curry County's low baseline per capita income above the state's baseline.

#### **Quality of Life During the M-X Operations Phase**

By 1992, the steady-state permanent M-X-related population influx will have leveled off at about 19,000 additional people, representing a 42 percent increase over the baseline population in that year. Over the 10 years taken to attain this level, the county will have been growing at a compound average annual growth rate of 3 percent. This steady rate is unlikely to markedly affect the quality of life in Curry County, since the County will have had some time to absorb and adjust to the influx of population. Consequently, impacts will not be as great as during the construction phase. Housing and community services will not be as heavily burdened (Figure 2.1.9-1, lower right quadrant). Social disorganization should not be as evident, and moreover, still be in better shape than the state, as manifested in crime and alcohol and substance abuse rates (Figure 2.1.9-1, lower right quadrant). The improvement in the economic well being dimension of the quality of life will slow down during the operations phase, but still leave Curry County better off, on two of these indices, than the New Mexico average. Per capita incomes are likely to still lag behind the average for the state.

#### **EFFECTS ON ENERGY (2.1.10)**

The effect of construction and operation of an operating base in the vicinity of Clovis will be minimal. Very few additional facilities will be required to handle the increased energy demand. The primary energy-related problem will be interferences between proposed M-X facilities, oil-producing fields, and pipeline systems.

The projected increase in electrical demand as a result of the proposed operating base and its related population growth is about 71 MW. The additional load could be supplied by upgrading the existing lines or construction of new transmission facilities. The additional demand would not represent a major impact to Southwestern Public Service Company, which can readily supply the bulk power requirements and would handle the planning, engineering, and construction of required transmission facilities. See the Power and Energy Technical Report for detailed information.

#### **EFFECTS ON TRANSPORTATION (2.1.11)**

Construction of an operating base at Clovis would actually involve expansion of an existing facility, Cannon Air Force Base. Therefore, traffic patterns in the area are not expected to change although the volume of traffic near the operating

base would increase substantially. The portion of U.S. 60 between the operating base and Clovis would have a large increase in traffic as a result of the project but the existing four lane road should be able to accommodate it. However, some modifications or improvements may be needed at critical intersections. Figure 2.1.11-1 presents anticipated future traffic. Refer to ETR-19 for a discussion of traffic generation and analysis procedures.

The in-migration of over 2,000 new households would generate around 20,000 trips or traffic movements, within communities near the base. (Refer to Section 2.1.4 for a discussion of the effects on population.) Most of the off-base development would likely occur within Clovis or its suburbs. Consequently, localized short-term congestion could develop at some locations, especially along approaches to U.S. 60 during peak periods, and some modifications or improvements to the street system may be needed at those locations.

The other communities within the area should not be significantly affected by increases in traffic associated with the project, although some critical locations where traffic concentrations occur may need to be modified or improved.

#### **EFFECTS ON NATIVE AMERICANS (2.1.12)**

Native American cultural resources are poorly documented for the entire Texas/New Mexico deployment area. No cultural resources are known that would be directly impacted by the construction and operation of an OB at Clovis. Indirect impacts due to increased population, recreation, and pot hunting are possible. Given the time and distance that separates Native Americans from the area and the amount of disturbance of Native American cultural resources that has already occurred, little acceleration of disturbance is expected. Impacts on Native American cultural resources in the region are judged, therefore, to be minimal.

There are no Native American reservations, colonies, water resources or land resources in the vicinity of the proposed operating base at Clovis, New Mexico. No impacts on Native American physical resources are expected.

Mitigations discussed are also applicable to the Clovis OB.

#### **EFFECTS ON ARCHAEOLOGICAL AND HISTORICAL RESOURCES (2.1.13)**

Specific information on the location of archaeological and historical resources at the Clovis OB site is not currently available; however, because of the proximity of this site to Blackwater Draw (a series of Early Man sites), adverse effects are likely.

The proposed construction area at Cannon AFB lies in an area known to have been inhabited by hunter-gathers for at least the last 12,000 years. Although only 18 archaeological sites have been recorded in Curry County, many others are certain to exist; Roosevelt County, where more research has been done, contains 296 recorded sites, one of which is on the National Register.

The historic period began in 1540, with Spanish trading, missionary, and exploring expeditions. Sites from this period near the proposed base are probably

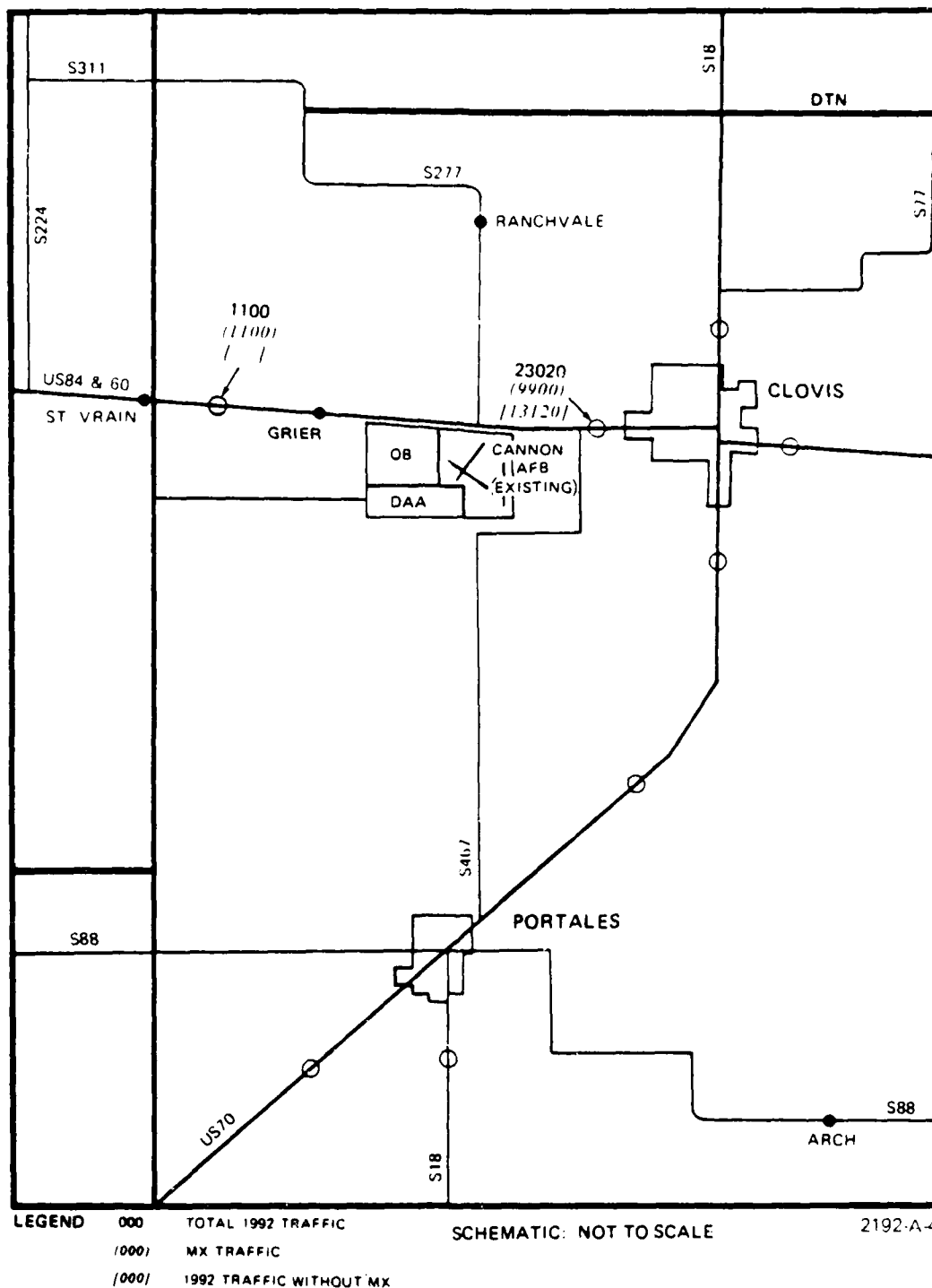


Figure 2.1.11-1. Projected traffic volumes in the vicinity of Clovis, New Mexico, assuming first operating base.

found near water. Ranching began in the 1880s, and was predominant until the early 1900s, when many ranches were cut up for farms. A records search will be performed to help document specific sensitive areas.

As depicted, the proposed Clovis OB would impact ten playa lakes, which have a predicted moderate sensitivity for archaeological and historical resources. These playas are scattered around the periphery of the proposed expansion area, and the designated suitability zone is too small to permit avoidance through redesign. A possible ancient tributary of Blackwater Draw, a high sensitivity area, immediately abuts the proposed OB.

Long-term increases in population that will result from siting an OB near Clovis will be a major source of indirect impacts to cultural resources in the region. Impacts to significant architectural resources are unlikely to occur at Cannon Air Force Base; however, population increase in Clovis may cause impacts to resources there. One National Register site, Blackwater Draw/Anderson Basin, is located approximately 5 mi south of the proposed Clovis OB. This site is a privately owned known source of gravel and may be impacted by further quarrying for OB construction.

Mitigation of potential impacts to resources in the construction area could be accomplished by avoidance and preservation. However, very little room for redesign has been allocated for the Clovis OB. If field surveys were to determine the existence of significant resources in the predicted sensitive areas and these resources could not be avoided, a comprehensive program of data collection and analysis would be required. Potential impacts to the Blackwater Draw site could be difficult to mitigate as the site is in private hands. Impacts to architectural resources in Clovis may be mitigated by preservation of significant structures and by design of new buildings in accordance with the existing styles.

Because direct and indirect impacts to National Register or eligible properties are anticipated and because resources of archaeological or historical interest may be encountered during construction, a program to identify and, to the extent possible, preserve these resources is planned. At the Air Force's request, the Advisory Council on Historical Preservation has prepared a Programmatic Memorandum of Agreement. This PMOA outlines a program which, if implemented, will avoid or satisfactorily mitigate adverse effects on cultural resources.

### **Paleontological Resources**

No significant effect on the few fossil occurrences in the western escarpment of the High Plains is expected.

## **2.2 NATURAL ENVIRONMENT**

### **EFFECTS ON VEGETATION (2.2.1)**

Soils will be impacted through several means during construction and operation of the potential OB site near Clovis. Erosion is slight due to the nearly level topography, but some erosion can be expected as excavation, earthwork, and other construction activities cause surface drainage patterns to change. There is a severe hazard of wind erosion in the Clovis area and this will increase as the dry soils are

loosened and moved about. This impact is significant in that the predominating soils of the area -- the Amarillo and Clovis series -- are among the most productive soils in Curry County. Disturbing these soils through erosion will make revegetation necessary.

Virtually all the land in the vicinity of Clovis is agricultural, so no native vegetation would be removed directly as a result of siting the primary operating base near Clovis. The nearest extensive area of native vegetation is located 25 mi north, in the Canadian Breaks areas, and consists of shrublands and woodlands of the floodplains and canyon uplands. This vegetation is expected to receive indirect impacts such as those discussed under the Proposed Action. The area of native vegetation to be affected from indirect impacts has not been quantified.

#### **EFFECTS ON WILDLIFE (2.2.2)**

There are no direct impacts of biological significance expected from base operations since the current level of disturbance in the area is high. However, the increased human population may result in significantly heavier use of nearby public lands for recreation. Increased hunting and use of ORVs will affect game animal populations and habitat.

Urban expansion of Clovis would directly impact a small number of playa lakes and associated upland game species, which are widely distributed in the surrounding agricultural lands. The agricultural area lost from urbanization would be small. The nearest important animal populations are in Grulla National Wildlife Refuge 20 mi to the south.

#### **EFFECTS ON AQUATIC SPECIES (2.2.3)**

As most of the operating base will occupy Cannon Air Force Base and proposed expansion would involve agricultural land, no direct significant impacts are expected on aquatic habitats. There may be indirect impacts on riverine systems being used recreationally, but this cannot be quantified.

#### **EFFECTS ON PROTECTED SPECIES (2.2.4)**

Due to the extensive agriculture in the Clovis area, there are no known protected plant or animal species in the vicinity, although Texas horned lizard and Central Plains milk snake may be present, as well as migrating birds of prey. The black-footed ferret was formerly in the area, but has probably been extirpated. A fuller evaluation of the potential of occurrence and impacts to this federally protected species will be performed in cooperation with the Fish and Wildlife Service under Section 7 consultation (Endangered Species Act). No protected aquatic species are known to occur in the vicinity of Clovis.

#### **EFFECTS ON WILDERNESS AND SIGNIFICANT NATURAL AREAS (2.2.5)**

The nearest significant natural area is Grulla National Wildlife Refuge (established to protect the lesser sandhill crane), 20 mi to the southeast and closed to the public. There are extensive sandhills between the proposed base and Grulla National Wildlife Refuge. There are few biologically sensitive areas in the vicinity of Clovis.

## **EFFECTS ON SURFACE WATER (2.2.6)**

Construction and maintenance of the operating base could have an impact on surface water due to increases in runoff and erosion. Storm runoff will be increased by the introduction of impermeable surfaces and channelization. Water quality may be effected by increased sediment loads due to construction. If surface rights are purchased, stream volumes may be locally reduced but reduction of total surface water volume will be partially offset by return flow after treatment, especially during the maintenance phase.

Water erosion impacts at the Clovis OB site are expected to be low due to the nearly level topography. Where local area of sloping topography exist or are constructed, disturbed soils should be revegetated and proper engineering design should be employed. Long-term impacts are expected to be insignificant if mitigation measures are followed.

Surface water is not generally available for use, due to prior appropriation of these waters. The only possible exception would be importation of surface water from the reservoir which presently has appropriated, but unused, water in necessary quantity to meet M-X demands.

Playa lakes are present in the Clovis base siting area and could be affected by siting the OB complex in this area.

## **EFFECTS ON GROUNDWATER RESOURCES (2.2.7)**

A M-X operating base (OB) might be located about 10 mi west from Clovis, New Mexico, adjacent to Cannon Air Force Base. The OB would include the existing Cannon Air Force Base airfield, some existing support facilities and clear zones, and necessary additional facilities consistent with use of the base as either an OB I or an OB II under either a split or full deployment basing mode. Including the existing airfield, the base would occupy about 6,000 acres.

### **Potential Impacts**

Annual M-X water usage for construction and operation would represent a minor increase in the region's current depletion rate, so the impact on water levels, underflow, or groundwater storage would be minimal. The current depletion rate of springs supplying Running Water Draw would increase slightly. Increase in surface runoff during major thunderstorms would be minimal; local increases in sheet and stream-channel erosion may occur. Construction activities could degrade surface-water quality during thunderstorms, but no significant impact on groundwater quality would be expected.

### **Mitigation Measures**

Potential well sites would be carefully selected to avoid interference with existing wells and springs in the region. A numerical simulation model of the region would be developed to project potential impacts on local users, and the extraction program would be altered accordingly. Aquifer tests would be performed following well construction, and the effects of withdrawals on groundwater system would be monitored in cooperation with state agencies. Alternative sources of water would

be evaluated to minimize the impact on the local environment. A local surface drainage system and erosion control structures would be constructed to safely convey runoff from the M-X operating base site to a regional drainage facility. Temporary retarding ponds would be constructed to reduce peak flows and to desilt the runoff water to avoid downstream deposition. After completion of the M-X project, the water supply system may be made available for local use.

## **EFFECTS ON AIR QUALITY (2.2.8)**

The logic employed in the selection of a particular air quality model and limitation of the models in predicting impacts are addressed in ETR-13.

### **Construction**

Figure 2.2.8-1 presents the PAL model results for two representative operating base construction area source sites and two emission levels, unmitigated and mitigated. The mitigated case assumes application of enough dust control measures to reduce particulate emissions by 50 percent. The effective distance to the potentially affected population is 10 mi. The results suggest that a dust problem would exist but due to the model limitations the predicted dust concentration shown as exceeding NAAQS standards, is only a rough approximation.

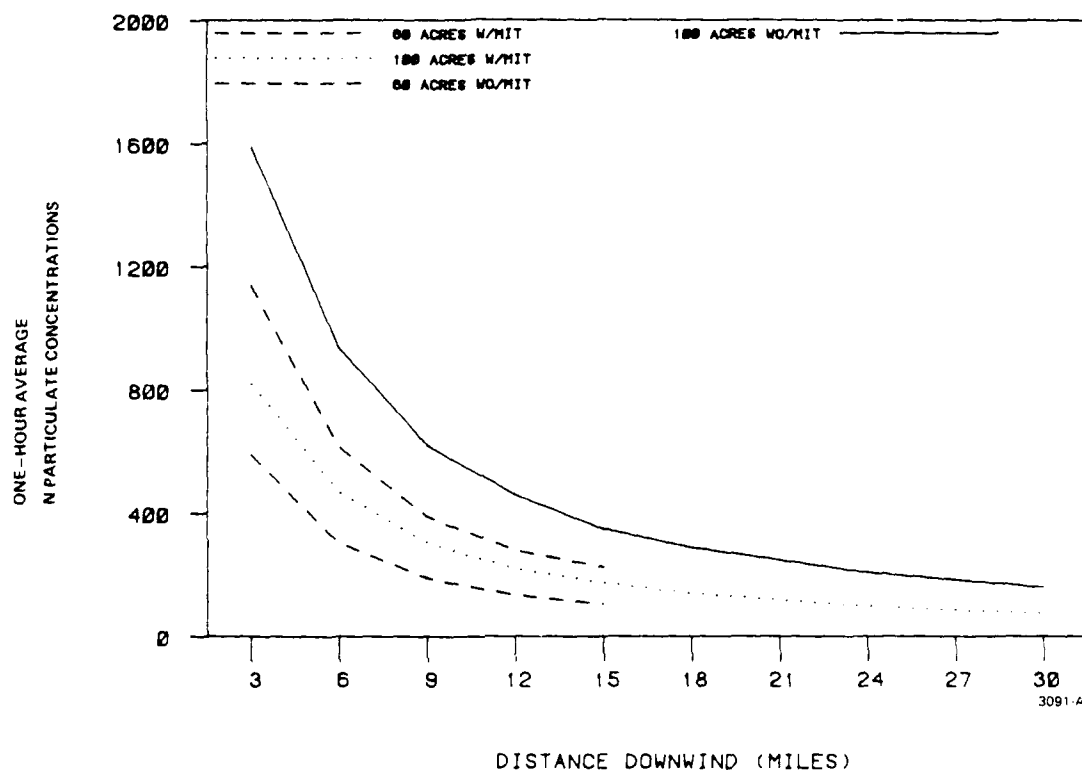
### **Operation**

For general operational emissions, the IMPACT model was run for two gaseous pollutants, CO and NO<sub>x</sub>. The emission levels were scaled from data for Vandenberg AFB, California, and redistributed to represent the expected operations base configuration. The results show that CO reached an hourly concentration of 1.3 ppm and NO<sub>x</sub> reached one hour average concentration of 0.11 ppm. (See Figure 2.2.8-2 and 2.2.8-3). The CO values are well below both the federal and New Mexico standards and no significant adverse impacts would be anticipated. The maximum one-hour NO<sub>x</sub> concentration of 0.11 ppm, while greater than the federal and New Mexico annual standard, is anticipated to be of short duration and should not lead to any significant long term impacts. The emissions of SO<sub>x</sub> and HC are less in magnitude than those of NO<sub>x</sub> or CO, so the concentrations will also be smaller. Thus, no violations of standards are expected for SO<sub>x</sub> and HC. The HIWAY model was used to examine the potential for local maxima of hydrocarbons, CO and NO<sub>x</sub> concentrations associated with peak-hour traffic. The results are shown in Table 2.2.8-1. The maximum predicted 1-hour average CO concentration of 15.0 ppm is well below the federal standard of 35 ppm but is above the New Mexico standard of 13.1 ppm. As there are no federal 1-hour average NO<sub>x</sub> concentration standards, a direct comparison of the modeling results with standards is not possible. However, the estimated values are not anticipated to be of long duration. Predicted HC levels for the peak hour exceed the 3-hour HC standard. It is possible the peak 3-hour level would also exceed this standard. Hydrocarbon concentration is of concern because of its role as a precursor to photochemical oxidant formation. Assessment of the potential for oxidant formation due to HC and NO<sub>x</sub> emissions would require sophisticated numerical modeling techniques.

## **EFFECTS ON MINING AND GEOLOGY (2.2.9)**

The Clovis OB site is not located near any mining or potential mining activity. No impacts other than an increased use of sand and gravel are expected.

# POTENTIAL FUGITIVE DUST IMPACTS DUE TO OB CONSTRUCTION

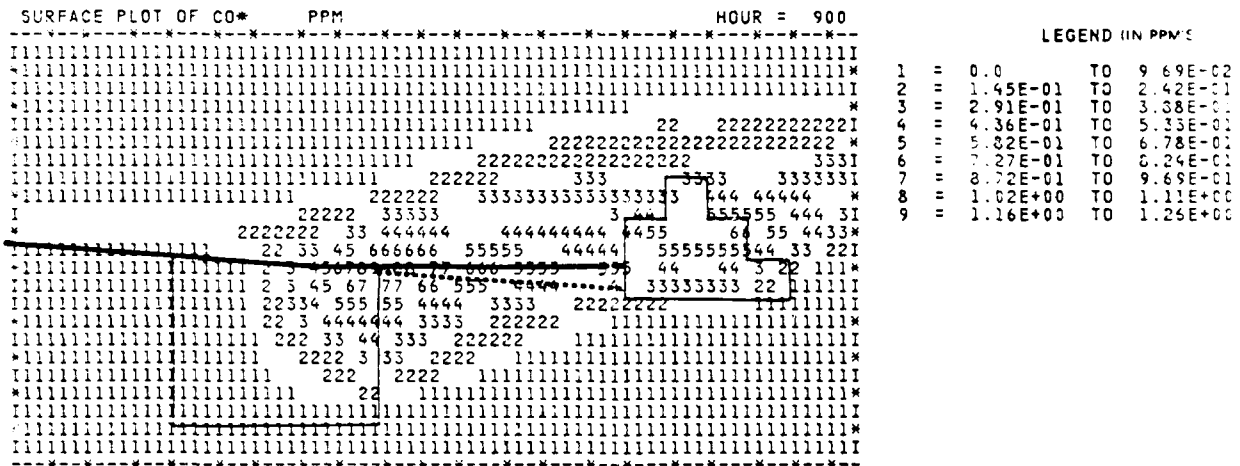
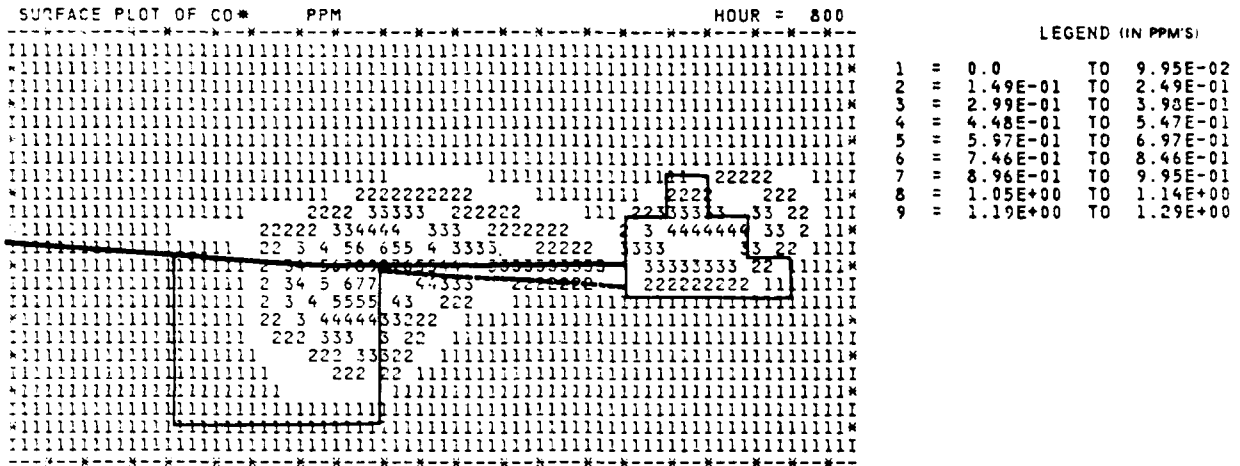


## NOTE

- 1.) CONCENTRATIONS ARE 1-HOUR AVERAGES. REPORTED IN MICROGRAMS PER CUBIC METER
- 2.) METEOROLOGICAL CONDITIONS: WIND SPEED = 5 m/s. STABLE ATMOSPHERE. 500 METER MIXING HEIGHT
- 3.) CONCENTRATIONS REPORTED FOR 60 AND 100 ACRES OF CONSTRUCTION ACTIVITY

Figure 2.2.8-1. Potential fugitive dust impacts due to OB construction.





\* NOTE: THIS IS A SCHEMATIC REPRESENTATION OF THE DATA RESULTS PRESENTED IN THE SURFACE PRINT  
FOR THIS SITE. BLANK SPACES INDICATE INTERMEDIATE VALUES BETWEEN ADJACENT INCREMENTS.

1994-A-1

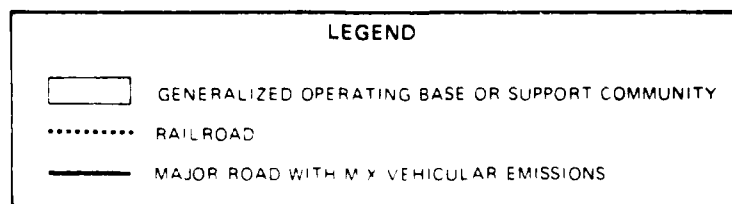


Figure 2.2.8-2. Predicted one-hour average CO concentrations at Clovis, New Mexico OB site and community.

AD-A095 781

HENNINGSON DURHAM AND RICHARDSON SANTA BARBARA CA

F/G 16/1

M-X ENVIRONMENTAL TECHNICAL REPORT. ALTERNATIVE POTENTIAL OPERA--ETC(U)

DEC 80

F04704-78-C-0029

UNCLASSIFIED

M-X-ETR-8

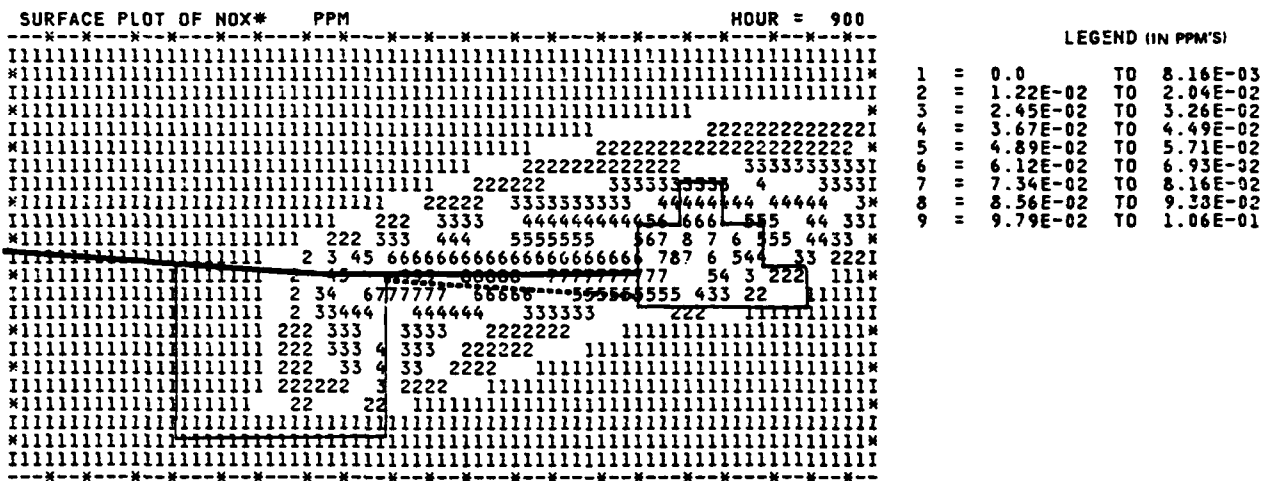
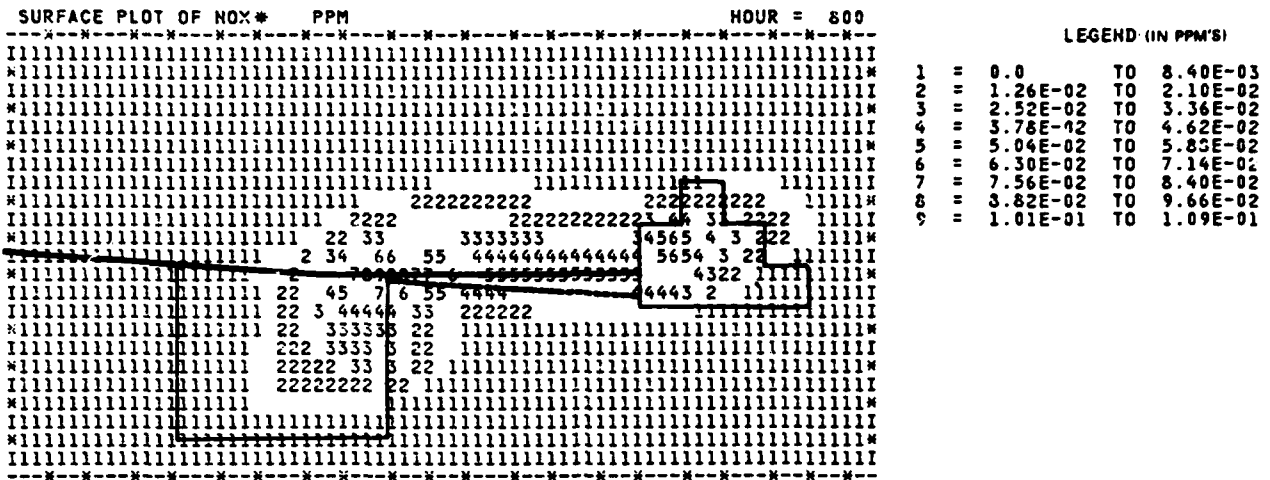
AFSC-TR-81-23

MI

0  
045



END  
DATE  
FILMED  
4-8-81  
DTIC



\*NOTE: THIS IS A SCHEMATIC REPRESENTATION OF THE DATA RESULTS PRESENTED IN THE SURFACE PRINT FOR THIS SITE. BLANK SPACES INDICATE INTERMEDIATE VALUES BETWEEN ADJACENT INCREMENTS.

1992-A-1

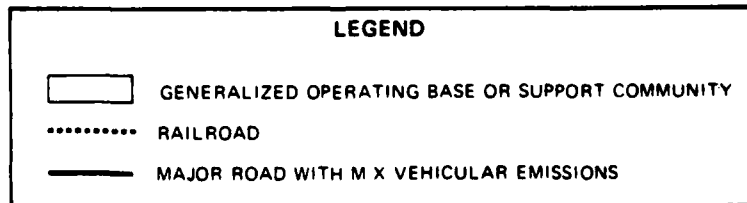


Figure 2.2.8-3. Predicted one-hour average NO<sub>x</sub> concentrations at the Clovis, New Mexico OB site and community.

Table 2.2.8-1. Clovis traffic-related pollutant 1-hour averages, concentrations, in ug/m<sup>3</sup> (ppm) 50 miles from edge of roadway.

CLASSIFICATION	PEAK HOUR TRAFFIC <sup>2</sup> VEHICLES/HR	CO	HC	NO <sub>x</sub>
Baseline	1,144	6,176 (5.40)	953 (1.41)	1,013 (0.54)
Baseline Plus M-X Induced Traffic	3,244	17,101 (14.96)	1,704 (4.06)	2,394 (1.54)

3131-1

<sup>1</sup>Meteorological conditions: 1 meter per second wind, 25 meter mixing height, wind parallel to roadway, very stable atmosphere.

<sup>2</sup>Peak hour traffic is assumed to be 15 percent of the ADT.

\*U.S. GOVERNMENT PRINTING OFFICE : 1981 O-723/284

